Systems in the Post-War Art School:
Basic Design, Groundcourse and Hornsey

Catherine Sloan

VOLUME I

PhD

The University of Edinburgh

2013

THE UNIVERSITY OF EDINBURGH

ABSTRACT OF THESIS

Regulation 3.1.14 of the Postgraduate Assessment Regulations for Research Degrees refers
These regulations are available via: http://www.ed.ac.uk/schools-departments/academic-services/policies-regulations/regulations/assessment

Name of Candidate: Catherine Sloan

Address : 10/2 Dalmeny Street,

Edinburgh

Postal Code: EH6 8RA

Degree: Doctor of Philosophy

Title of Thesis: **Systems in the Post-War Art School: Basic Design, Groundcourse and Hornsey**

No. of words in the main text of Thesis: 85,000

This thesis makes the first sustained attempt to locate post-war British art school pedagogy in relation to systems-inspired cultural practice after World War II. I explore how in the post-war era in Britain, system, cybernetic and network theories had an instrumental presence in visual arts pedagogy and practice which marked a fundamental shift in the values of cultural production. This was informed both by General System Theory, which had emerged in biology before the war (GST) and its part in the new systemic presence across culture and economy in the wake of the war. I draw out this cultural trend through the examination of student work of the period, pedagogical documents and new interview material with teachers and students.

The immediate post-war years form one of the most vital periods of technological development of all time, in which the physical and biological sciences played an ever-more prominent – and integrated - part. The pedagogies of 1945-1970 incorporated a range of systemic and mechanical approaches into creative practice, which had a clear link to contemporaneous technological developments. That mechanisms, networks and systemic approaches were a fundamental aspect of visual arts pedagogies of the period is a phenomenon which has never been analysed and this is the task of this thesis. This was manifested both in the subject matter of classes and courses and in the teaching structures and models that this thesis will examine. These consist of the Basic Design movement, Groundcourse and the Hornsey protest of 1968. The presence of mechanics as process, pedagogy, practice and symbol within British art education demonstrates the evolving importance of technology within culture. With this in mind, each case study within this thesis investigates systems characteristics of British art school pedagogies during the period. The underlying aim is not to create a narrative account of each pedagogical moment, but rather to pursue the material and cultural influences which shaped their development.

Dedicated with love and thanks to

Morna Sloan

and

Richard Sloan

‘As the organism and its environment are to be treated as a single system, the dividing line between ‘organism’ and ‘environment’ becomes partly conceptual, and to that extent arbitrary. Once this flexibility of division is admitted, almost no bounds can be put to its application. The chisel in a sculptor’s hand can be regarded as a part of the complex biophysical mechanism that is shaping the marble, or it can be regarded as part of the material which the nervous system is attempting to control. The bones in a sculptor’s arm can be similarly regarded either as part of the organism or part of the ‘environment’ of the nervous system. Variables within the body may be justifiably regarded as the ‘environment’ of some other part.’[1]

William Ross Ashby   1960

[1] Ashby, W. R. (1960) *Design for a Brain.* Chapman and Hall. London. p. 40

Table of Contents

0.Introduction

Groundcourse Behavioural Project 1965

i) Systems and the Art School

This thesis is the first sustained attempt to locate post-war British art school pedagogy in relation to systems-inspired cultural practice after World War II. In the post-war era in Britain, system, cybernetic and network theories had an instrumental presence in visual arts pedagogy and practice which marked a fundamental shift in the values of cultural production. This was informed both by General System Theory, which had emerged in biology before the war (GST) and its part in the new systemic presence across culture and economy in the wake of the war.[2] Underlying both was one of the most vital periods of technological development of all time, in which the physical and biological sciences played an ever-more prominent – and integrated - part. That mechanisms, networks and systemic approaches were a fundamental aspect of visual arts pedagogies of the period is a phenomenon which has never been analysed and this is the task of this thesis.

As noted this analysis will be very much situated in a post-war context. The impact of mechanised warfare and the resultant integration of systems thinking across disciplines after World War II had a cultural legacy, as the technology of every age does. The art

[2] General System Theory made an instrumental contribution to logistics and weapon design during WWII and after the war there was a spate of publications dealing with systems identification and behaviour. This included Ludwig von Bertalanffy's 1969 publication: *General System Theory: Foundation, Development, Applications.* George Braziller. New York.

schools had to confront not only the ongoing problem of what art training could be in an increasingly mechanised world, but also the changing material language of culture given the evolving technologies which shaped modern life. That the pedagogies of 1945 to 1970 incorporated a range of systemic and mechanical approaches into creative practice has a clear link to contemporaneous technological developments. This was manifested both in the subject matter of classes and courses and in teaching structures and models as this thesis will demonstrate. The presence of mechanics as process, pedagogy, practice and symbol within British art education demonstrates the evolving importance of technology within culture. Furthermore, pedagogies of surveillance and control evolved in the post-war years which mirror the tensions of the Cold War military programme.

With this in mind, each case study within this thesis will investigate systems characteristics of British art school pedagogies during the period. The underlying aim is not to create a narrative account of each pedagogical moment, but rather to pursue the material and cultural influences which shaped their development. I argue that art school pedagogy needs a fuller critical analysis, particularly in the context of the complex agendas of high modernism. From the immediate post-war years in which the interface between technology and nature became the basis for teaching abstraction, to the complex cybernetic approaches of the 1960s, there were numerous unique teaching models which incorporated live issues in science and technology. As Sigfried Giedion wrote in 1948, 'Tools and objects are outgrowths of fundamental attitudes to the world.'[3] He made this very telling point in the post-war years, after the new

[3] Giedion, S. (1975) *Mechanization takes Command: A Contribution to Anonymous History.*

technologies of warfare had created a philosophical and moral problem beyond imagination. Giedion was an important theoretical influence on Richard Hamilton and other members of the Independent Group as discussed later in this thesis.

Evolving technologies and the legacy of warfare are vital herein as a constant presence in the formal language and underlying structures and approaches in art education of the period, from systemic abstraction in Basic Design to more performative and conceptual engagement with analogue computing at Ealing. By drawing these case studies together I will highlight the complex shift in focus for art education that took place and the extent to which it was created by the new age of technology in culture.

ii) Critical Histories

The theme of technology and science within the British art school has been discussed by various scholars, but always forming a minor element of an account of a single institution or the practice of single educator and in the form of book chapters, articles or theses. Furthermore, none have addressed the issue of post-war pedagogy within the school of art as a defined issue by considering the impact World War II had upon cultural production. There is also a lack of discussion about the extent to which World War II prompted the increasingly prominent presence of technology within visual culture, both within and beyond the schools of art.

In part these lacunae can be attributed to the fact that much of the scholarship on the modern and contemporary school of art is relatively recent. As a result, there is a deficit of published accounts of both individual art schools and of broader issues and trends in higher art education in Britain. There are some useful resources, such as Clive Ashwin's thorough account of policy development in higher art education, but few examples of histories which identify and interrogate tendencies or trends in the art school within a wider cultural context.[4] There has been a collective recent push to bridge gaps in the history of modern and contemporary art school education and the common trend toward single narrative accounts is understandable in the context of the perceptible gap in the critical history of the art school. However, this overarching style of narrative means that there is often a lack of depth and scrutiny.[5] The most curious omission is what appears to be the key issue: what visual art pedagogy is; how it evolves, how it is managed and what function it has in a wider cultural context.

An example of this problem is the 2010 book *Art School: Propositions for the 21st Century,* edited by Steven Henry Madoff, which was unusual in its intention to explore trends, tendencies and developments in the art school rather than the dominant style of recounting narrative institutional histories or individual courses.[6] This collection of essays explored key issues for art school education with an international focus, but given that this is the most recent meditation on the evolution of the art school after the twentieth century, it gave little critical attention to the nature of this evolution and its relation to any wider context of cultural change.

[4] Ashwin, C. (1975) *Art Education: Documents and Policies 1768-1975.* SRHE. London.
[5] The Tate research project *Art School Educated* of 2008-13 saw researchers and postgraduates investigate British art education since 1960, but this project was limited by the necessity of direct connections to the Tate collection.
[6] Madoff, S. H. (2009) *Art School (Propositions for the 21st Century)* MIT Press. MA.

The book was posited as a kind of meditation on what ‘an art school…might and will be in this new century’ but despite this the collection barely touched upon postmodernity. Instead it holds within its pages several discussions of avant-gardism, the issue of 'inheritance and invention', and the legacy of Duchamp.[7] In his chapter entitled *Education by Infection* (comparing the transmission of ideas/practices to viral disease), the artist, critic and educator Boris Groys comments that 'Contemporary art, of course, is the heir of the historical avant-garde'.[8] Groys’ research interests revolve around the avant-garde, particularly in relation to Russian art and culture. Perhaps his focus on avant-gardism over postmodernism in education can be understood better in this context and since Groys believes that modernism has survived in the form of the ‘total artwork’.[9] Thierry de Duve, in his essay *An Ethics: Putting Transmission in Its Proper Place in the Art World,* comments wearily that:

‘We no longer believe in these tabulae rasae prophesised by the artists of the historical avant-gardes, but we still believe firmly in the one tabula rasa that claims that the concept of art itself changed irretrievably after Duchamp. '[10]

While Madoff himself states that:

'...there has been one unstoppable influence, particularly after the 1960s: the juggernaut of Marcel Duchamp as the tutelary spirit hovering above art as the outward sign of an idea manifested through any sensory means, using any object from any precinct of production as its instrument....'[11]

However, avant-gardism – or any other cultural trend or tendency - in the school of art needs expansion beyond that of a kind of downwards inheritance from the surrounding

---

[7] For a critique of avant-garde 'defer and suggest' ideologies, see Pollock, G. (1992) *Avant-garde Gambits,1888-93.* Thames and Hudson. London

[8] Groys, B. (2009) “Education by Infection”. *Art School: Propositions for the Twenty-First Century.* MIT Press. MA. p. 27

[99] Groys, B. (1992) *The Total Art of Stalinism: Avant-garde, Aesthetic Dictatorship, and Beyond.* Princeton University Press. Oxford.

[10] Madoff. *Op. Cit.* (2009) "An Ethics: Putting Transmission in Its Proper Place in the Art World", p.20

[11] Madoff. *Op. Cit.* (2009) p. ix

‘art world’ to the training ground. Moreover, to discuss the postmodern school of art within the context of high modernity is to avoid the issues that are really relevant to the last fifty years of art education. Since the mid-twentieth century, art schools have been the site for experimental pedagogy and practice, often led by some of the most successful artists of the decade. They are in their own rights inventive, creative and deserving of a fuller approach in terms of the historical interrogation of their development.

Aside from Madoff, there is not to my knowledge another publication that groups art schools together by tendency; instead the majority of the literature of the school of art is focused upon a single chosen institution, individual teacher or course, as well as a small number that deal with national policy and practice as part of a developmental history. In the case of the former, the history of the art school becomes either institutional or tied to the practice and approaches of identified pedagogues. This means that there are a number of accounts and discussions relevant to each of my case studies. I will review the literature of each case study individually below.

Basic Design

Basic Design peaked between 1955 and 1965. It consisted of a number of experimental ‘basic’ courses, summer schools, classes and so-called ‘basic research’ modules for art and design students, as well as many associated teaching practices within the art and design curriculum. These courses and classes explored the qualities of abstract visual language – the dot, the line, colour and structure – while also focusing on provoking formal outcomes rather than expressive or individual responses.[12] Basic Design, despite wide-spread dissemination and publicity, has a literature that revolves around accounts of single institutions and their staff.[13] An exception to this is David Thistlewood's catalogue essay for the exhibition *A Continuing Process.*[14] The exhibition offered a retrospective overview of the Basic Design movement, with some issues and omissions. The exhibition and accompanying catalogue offered a short summary of the movement, focusing on the influence of Herbert Read upon the movement, thus linking it with expressivity and child art.[15] This was to the exclusion of the other, more technical and philosophical facets of the movement, which will be drawn out in this study. Notably, the exhibition omitted William Johnstone and the Central School of Art, something which will be examined and rectified later in this case study. Much of the rest of the literature around Basic Design appears to have been stimulated by the exhibition and its catalogue.

This includes the single most important contribution to the history of Basic Design thus far – that made by Richard Yeomans.

Yeomans had been prompted to research Basic Design for his PhD after witnessing the debates created by *A Continuing Process* in and after 1981. Yeomans too was a former student of King's College and it was twenty years later when he created the most thorough critical account of Basic Design at King's College to date, first writing

[12] For the most complete overview of Basic Design method See De Sausmarez, M. [1964] (2006) 2nd Ed. *Basic Design: the Dynamics of Basic Form.* A. C. & Black. London.

[13] See Walker, J. A. (2003), Forrest, E. (1983) & (1985), Yeomans, R. (1987)

[14] Thistlewood, D. (1981) *A Continuing Process.* Institute of Contemporary Arts (London)

[15] Thistlewood wrote his doctoral thesis about Herbert Read, and later wrote on his aesthetics: Thistlewood, D. (1984) *Herbert Read: Formlessness and Form: An Introduction to his Aesthetics.* Routledge. London.

his PhD on the subject, and then a subsequent journal article and book chapter.[16] Yeomans identified the key conflict in the art schools during the 1950s; the tension between individual expression which predominated in both art practice and all levels of teaching, and the technological advances in industrial production.[17] However, where this study differs is in its pursuit of a more rigorous context for Basic Design pedagogy. This is in terms of taking a more analytical view of the movement in the context of the cultural and technological events which stimulated it, particularly how this was manifested in the work produced by staff and students.

Yeomans has something in common with a surprising number of authors writing about schools of art: he had, as a student, experienced the pedagogy of Hamilton and Pasmore first-hand. This is also true of the three other authors who have contributed to creating a partial history of Basic Design in the form of theses, articles, book chapters and essays. This included Thistlewood, as well as Erik Forrest and John A. Walker. Thistlewood studied at Leeds College of Art in the early 1960s, experiencing the Basic Design curriculum there.[18] Walker self-published an essay on his time at King's College as a short book in 2003, through a publishing company he founded with Rita Hatton. In this essay he gives a full account of his experiences, mainly written in the style of a memoir.[19]

[16] See Yeomans, R. (1987) *The Foundation Course of Victor Pasmore and Richard Hamilton 1954-1966.* Doctoral thesis. Institute of Education, University of London., Yeomans, R. "The Pedagogy of Victor Pasmore and Richard Hamilton". In Romans, M. (ed) (2005) *Histories of Art and Design Education.* Intellect Books. Bristol and Yeomans, R. (1988) "Basic Design and Richard Hamilton's Teaching". *The Journal of Art and Design Education.* Vol. 7. No. 2. 1988. pp. 155-156

[17] Yeomans, R. (1987) *The Foundation Course of Victor Pasmore and Richard Hamilton 1954-1966.* Doctoral thesis. Institute of Education, University of London.

[18] Steers, J. et al. (2002) "David Thistlewood Obituary. *Journal of Art and Design Education.* Vol. 18. Issue 3. Dec. 2002. pp. 261-269. p. 267

[19] Walker, J. A. (2003) *Learning to Paint: A British Art Student and Art School 1956-61*, Institute of Artology. London.

There are two short articles by Ohio arts education researcher Erik Forrest, which examine the Basic Design innovations at Leeds College of Art – the first is *A Basis for Art Education*, which was published in 1965 when Basic Design was almost over. Forrest's article used the Basic Design movement as the locus for a broader discussion about what a 'basic' education for artists ought to be. He looked at Basic Design in more depth in the 1980s when he wrote his doctoral thesis about Basic Design at Leeds.[20] In an article on the subject in 1985, *Harry Thubron at Leeds and Views on the Values of his Ideas on Art Education for Today*, Forrest presents Thubron's early ideas of exercises 'a la Paul Klee', and briefly approaches the other key textual and creative influences which will be examined within this section.[21] The article firmly contextualises Basic Design at Leeds as a Bauhaus model, as well as highlighting Thubron's interest in personal development and his debt to Herbert Read. However, Forrest also offered a robust defence of Thubron in the face of subsequent criticisms of his techniques. He claimed that Basic Design was innovatory in its confrontation of what had since turned out to be enduring issues for the subject – art and design training in the age of science and technology. This same point underpins this study, which will explore in the context of post-war culture.

Groundcourse

Groundcourse was Roy Ascott's model for a two-year foundation course in art which drew in cybernetics, behavioural psychology and analogue computing and took place first at Ealing College and then at Ipswich, between 1961 and 1965. There are three

[20] Forrest, E. (1983) *Harry Thubron: His Contribution to Foundation Studies in Art Education.* Doctoral thesis. Ohio State University. Ohio.

[21] Forrest, E. (1985) "Harry Thubron at Leeds and Views on the Values of his Ideas on Art Education for Today". *International Journal of Art and Design Education.* Vol. 4.2. pp. 147-167

published accounts of Groundcourse, as well as a number of articles by Ascott himself written during and after the period under discussion. The most brief of the accounts by other scholars is the page-long feature by Emily Pethick, *Ground Zero.*[22]

In the 2003 collection of Ascott's writings *Telematic Embrace,* Edward A. Shanken included an account of Groundcourse within his introductory essay.[23] He set out a few of the exercises which students at Ealing and Ipswich experienced, including games and mind-mapping. As Shanken's observations about Groundcourse were part of a far longer chapter recounting Ascott's whole career, he did not give an extended discussion of the evolution of Ascott's pedagogy, the other staff involved or the place of the course in the history of British art education. Groundcourse was treated by Shanken as a facet of Ascott's practice, his personal interest in art and cybernetics made concrete by pedagogy. While Ascott's own creative interests were vitally important to Groundcourse, the broader context must be how these interests evolved over the period and how the course reflected the developing social and cultural significance of cybernetics.

The other source which deals with Groundcourse is Michael Bracewell's book *Re-make/Re-Model: Becoming Roxy Music.*[24] Bracewell is a critic and a writer of both fiction and non-fiction; he has written a number of books concerning Roxy Music. Groundcourse was included since Brian Eno was a student of Ascott's at Ipswich in

[22] Pethick, E. (2006) "Degree Zero". *Frieze Magazine, issue 101*

[23] Shanken, E. A. "From Cybernetics to Telematics: The Art, Pedagogy and Theory of Roy Ascott". In: Ascott, A. (2003) *Telematic Embrace: Visionary Theories of Art, Technology and Consciousness.* University of California Press. California. pp. 34- 39

[24] Bracewell, M. (2007) *Re-Make/Re-Model: Becoming Roxy Music.* De Capo Press. Cambridge. pp. 195-208

1964-5. While the author's object was to create a thorough history of the early development of members of Roxy Music, he also covered Basic Design at King's College since Bryan Ferry studied for his fine art degree under Richard Hamilton.[25] In his brief account of Groundcourse, Bracewell makes the link between Ascott's pedagogy and his personal experience of cybernetic warfare, particularly in terms of Ascott's experience of the total environment of fighter control, its electronic signage and the interaction of transmitted information and symbolic objects. However, given the overall subject matter of the book as a popular history of a pop group, the discussion of Groundcourse was necessarily brief, amounting to a few pages. Many of the issues around behaviourism and cybernetics discussed in depth within this case study were giving fleeting mention in Bracewell's book. However, as Bracewell's overarching concern was the creative development of members of Roxy Music, his discussion of the content of Groundcourse was thus limited to a set of philosophies and tendencies which were relevant to Eno's development.

Hornsey

In my final case study I examine the pedagogical developments that took place during the six week protest at Hornsey College of Art in 1968. The background to the Hornsey protest, as well as the documents and policies which shaped art education in the 1960s was recently addressed by Lisa Tickner in 2008, with her short book *Hornsey 1968: The Art School Revolution.*[26] I approach the protest from a different perspective. While the unsettled and restrictive environment caused by the new DipAD did create the

[25] *Ibid.* pp. 111-144
[26] Tickner, L. (2008) *Hornsey 1968: The Art School Revolution.* Frances Lincoln. London

conditions for protest, this was not what made the sit-in extraordinary. In fact, the politicised actions of the students and staff involved created the surface layer of what was a complex response to the educational policy and practice of the era. In Tickner's concise account of the events at Hornsey, her focus was recording the circumstances which contributed to the affair, as well as recounting the sequence of events. She writes:

'Forty years on, the occupation emerges not only as a 'social drama' revealing latent conflict (over the rights of students, the politics of design, the needs of the 'microphysics of power', of power in its 'capillary forms', surging and ebbing through the charged relations of 1968.'[27]

Tickner offered a thorough account of events based around the locus of the policy changes behind the DipAD and she synthesised for the first time the many factors which contributed to the conditions for the protest. However, her short book did not analyse the material culture at Hornsey. The issues of precisely how art and design students were being taught at Hornsey, the nature of the exercises, the formal and conceptual qualities of student work still lack critical attention.

As discussed in the introduction to this thesis, the lack of critical attention given to material culture within histories of the modern school of art is quite common, perhaps due to the relative deficit of scholarship on the subject to date. The disjuncture between the narrative of art school histories and their material culture is an interesting problem. Without the core art historical tools of visual analysis and the deconstruction of material and critical values, we are left with a narrative which recounts a chain of actions and reactions with little context about the production values within the college.

[27] *Ibid*. (2008) p. 8

The very common issue when it comes to art school histories of direct involvement of authors also applies here, as Tickner noted in the introduction to her book:

'I too am 'folded inside' the history of Hornsey College of Art. I enrolled in 1961, when I was sixteen, on the intermediate course (the first two years of the four-year National Diploma in Art and Design), and switching in 1962 to the pre-diploma course (the foundation course for the new Diploma in Art and Design). In 1966 I graduated with the first cohort of DipAD students…In the autumn of 1968 I was invited back to teach Art History part-time. Hornsey, and its successor institutions, have been at the centre of my professional life.'[28]

While Tickner did not start teaching at Hornsey until after the sit-in, she also notes that:

'In fact, I still had friends at the college and was an intermittent visitor to the college and to 14 Hanley Road where the rump of the sit-in adjourned in July. Coming clean about this, I should like to think it places me closer to a 'participant observer' (in terms of anthropology) than a contaminated witness (in terms of law).'[29]

The caution of former art and design students in turning the lens on their schools of art is a curious one; whatever our subject, we are 'contaminated' by our studies, the institutions which control them, the specific interests and approaches of teaching staff within them. The complicated issues around art and design school histories for the former art students who often write them could be the heightened sense of involvement which art training creates. The focus on process and production and the self-reflexivity of studio practice, collide, for students, with the very public outcomes of group criticism and eventually exhibition. Therefore former students had both agency (through practice) and a sense of having participated (through collective criticism and exhibition) within the unique environment of the art school.

[28] Tickner. *Op Cit.* (2008) p. 7
[29] *Ibid.* (2008) p. 8

Just as Tickner was involved with Hornsey, as noted the key authors of the Basic Design movement were all former students too, including Yeomans, Walker and Thistlewood.[30] Tickner's telling vocabulary highlights the main problem - a desire to control this 'contamination' of involvement leading to a somewhat stripped back approach to retelling the stories of the modern art school, particularly apparent in the surprising lack of critical engagement with art itself. At the centre of each school of art, there is a culture of creative activity; the production of both concepts and of physical objects, a complex interaction between staff and the student body through the formalising structure of pedagogy. Interestingly, the art itself has been undervalued (the work of mere students), excluded from critical analysis in its own right, obscured behind the larger process of academicisation which was taking place throughout the post-war years.

iii) Methodology: An Outline

'System 1a set of things working together as parts of a mechanism or an interconnecting network; a complex whole'[31]

If art created by students is not given thorough critical analysis, then there is a clear issue around ownership, authenticity and collective production within the school of art. This in turn relates to the power structures within the school of art and the relative ownership and control exacted by teaching staff, administration and national policy. It is a key proposition of this thesis that art school pedagogy is the point where the concerns of contemporary art are crystallised, or systematised. It is a point of cohesion

[30] Forrest, E. (1985), Thistlewood, D. (1981), Walker, J. A. (1981), Yeomans, R. (1987)
[31] Oxford Dictionary Online. Definition of 'system'. Accessed online 10/12/12 at: http://oxforddictionaries.com/definition/english/system?q=system

for the disparate practices of artists, the process by which creative ideologies are broken down and taught. It is also the point at which we can perceive education as a system, not only as a process. I argue that the existing literature of the twentieth century art school neglects this essential layer of productivity. In order to widen the contextual frame around production in art schools it is necessary to analyse a broader and more diverse set of sources. This creates some methodological issues which will be reviewed and resolved here.

My first set of methodological concerns are practical, concerning the nature of the sources, objects and texts used to construct this narrative. The use of text as evidence of ideological development in arts pedagogy presents a problem – that of parallelism. For example, Richard Hamilton highlighted the vital place which both *Mechanization Takes Command* by Sigfried Giedion and *On Growth and Form* by D'Arcy Wentworth Thompson had on the development of his practice and his teaching.[32] However, this can only be seen as a measure of his conscious influences and objectives. In postmodernity our notion of the artist's process has changed to include the vast web of influences - of signs, symbols and ideas - which an individual experiences and absorbs as most famously argued by Roland Barthes in his essay *The Death of the Author*.[33] However, it must be acknowledged that there is always an element of parallelism in the interpretation of visual art because visual analysis is, by nature, comparative.

[32] Giedion, S. (1948) and Thompson, D. A. W. (1917)
[33] Barthes, R. (1977) "The Death of the Author". *Image, Music, Text.* Fontana. London. pp. 142-148

We examine the art object for likeness to life, to existing ideas or to other works of art. Moreover, even in modernity visual art operates through parallelism as its successful fulfilment of function relies on recognition on the part of the viewer; recognition of sensation, emotion, meaning or form. For this reason I have consciously created parallels at points in each of my case studies, comparing image to text, object to work of art, technology to pedagogy. In each case, the parallels draw out the presence of a language of war: a language which becomes apparent through comparison. When reviewing a fixed temporal period such as the years 1945 to 1970 which are the boundaries of this study, then the various and shifting interactions between technologies, material culture, the sciences, the arts, philosophy and literature can be understood as a kind of field of production.

Ludmilla Jordanova writes that 'science and literature are united in their shared location within cultural history'; in fact, every layer of cultural production might be considered as part of this same interaction, regardless of art form.[34] Hence it is the assertion of this study that limiting the contextual frame for modern art education has had a detrimental effect on its histories to date. Indeed, many of the critical approaches employed within are intended to widen the contextual frame for the art school, while drawing out the complexity of pedagogy as the point where layers of interacting influences meet.

In terms of foregrounding key texts for comparison with art objects and teaching practices within this study, I offer two defences of my methodology. Firstly, in each

[34] Jordanova, L. (ed) 'Introduction'. In: *Languages of Nature: Critical Essays on Science and Literature.* Free Association Books. London. p. 15

case, the artist-teacher or student highlighted texts because they best represented their interests and subsequent achievements in the post-war period. This is reason enough to compare their content to the resulting pedagogies and students works which relate to it. *Mechanization Takes Command* is most clearly present as an influence on Hamilton whose students often created diagrammatic drawings of machine parts but an interesting symbiosis took place between Basic Design institutions, resulting in analysis of machine elements becoming a common practice amongst art students.[35] Ideas spread, evolved and transformed through the network of individuals who taught and learned together.

This process sees a concept – the mechanization of modern life - translate into image and object and thus become part of the symbolic representation of the contemporary world. Through examining in detail the kind of textual influences which informed pedagogy during the period, I will establish the creative validity of art education as a site of cultural production (not just replication) but also track the integration of technology as a metaphor for contemporary life. The problem of parallelism addressed above is resolved when this process of analysing the complex influences upon pedagogical production is applied; the classes, courses and resulting works of art are thus explored as part of an engaged process, not just by visual likeness.

The final methodological problem to be resolved here is the question of art historical engagement with pedagogy. The examples of student work which are scrutinised within this study are not just independent works of art; they are exercises. The artworks

[35] Giedion, S. (1975) [1948] *Mechanization takes Command: A Contribution to Anonymous History.* Oxford University Press. Oxford.

in themselves, including the Basic Design focus on managed outcomes and planned disruption, Groundcourse controlled group exercises and Hornsey's staff and student works of protest, are therefore part of a larger conceptual drive than that of the individual. This could in part explain the lack of formal analysis within art history of student works of art, despite the fact that art schools and archives across the country have exceptional and rich collections of examples available.[36]

These works of art certainly need to be read in their proper context of pedagogy and collective practice, but this should not eliminate them from technical and conceptual analysis. All works of art are part of a network of influence and meaning; none are hermetically sealed. I want to emphasise, however, that the works of art examined within this study will be treated as evidence of sorts because that is essentially what every work of art is when placed in a historic context. The examples of student work form a locus for the pedagogical, cultural, professional and institutional debates from which they sprung.

iv) Exploring Pedagogy, Power and Systems

As noted, this study takes a broad and networked approach to reading the culture of the school of art in order to analyse it as part of a broader history of post-war culture. Using pedagogy as a more defined concept creates a number of epistemological problems which will be explored here. Interacting systems of power, meaning and influence are the fabric of pedagogy. In fact, the term pedagogy originates from

[36] It was common practice to retain diploma works in the twentieth century, and in addition, many collections have been accepted by the National Art Education Archive at Bretton Hall. This includes a Basic Design collection from Leeds and Durham. The project was started by David Thistlewood.

pedagogue - a slave-boy accompanying children to school - and this etymological path thus implies an element of strict control, a guiding influence to keep the young on the righteous road to knowledge.[37] In the twentieth century the word gained a new currency in educational theory, a catch-all term to imply the underlying rules and structures shaping the educative process. Thus pedagogy is the level on which educational change plays out: how we structure the learning experience reflects broader agendas, whether they are economic, social or cultural.

Pedagogy is used as a term of reference often within the literature of higher art education but never as a concept to be interrogated. Furthermore, the compelling and relevant literature around pedagogy as power has never been applied to the school of art. The pedagogy of the modern art school is therefore all but invisible in existing literature, in which courses and classes are connected to individuals, dominant movements and styles as well as the policy changes taking place in the background. The student experience is often treated in a perfunctory way, as if the student body were mere pawns within a system which entirely depended upon the creative innovations taking place elsewhere, or at the very least at the hands of the teachers.

Given that the period of development reviewed within this thesis saw the issue of pedagogical control in the art school explored, manipulated and eventually politicised and revolutionised, then the key epistemological issue for this study is therefore that of power and pedagogy within the context of cultural production and how this may be

[37] 'Late Middle English: via Latin from Greek *paidagōgos*, denoting a slave who accompanied a child to school (from *pais*, *paid*- 'boy' + *agōgos* 'guide')' From Oxford Dictionaries online, accessed Feb 25 2012 at: http://oxforddictionaries.com/definition/pedagogue

fruitfully approached and managed. Thus the key philosophies of 'Critical Pedagogy' are applied in this study to manage the issues of power and control highlighted above. It was in the late twentieth century that Critical Pedagogy emerged as a new branch of pedagogic enquiry that sought to question the way that educational institutions control and manipulate knowledge-as-power, particularly within context of wider economic and political agendas. Its main figures included Paulo Freire and Henri Giroux. Freire, writing on the way that the state manipulated the education system in Brazil in order to maintain social equality instead of challenging it, commented that:

'Consciousness of and *action upon* reality are, therefore, inseparable constituents of the transforming act by which men become beings of relation.'[38]

He argues for a more active kind of education, an education that speaks the language of the people it is intended to help, an education that will create *beings of relation,* people who are aware of the power of their own actions both within the educative process and in wider society. Freire was writing against the backdrop of a military coup in Brazil in the mid-1960s, which had exiled him from his country and caused the collapse of a training scheme he had developed to offer sugarcane farmers across the country intensive – and highly successful - literacy courses. The control of, and access to education was a worldwide issue in 1968 and Freire's articulation of the political powers behind pedagogy has particular resonance in this context. Even today, the Oxford Dictionary describes education as:

'1 the process of receiving or giving systematic instruction, especially at a school or university: *a course of education'*[39]

---

[38] Freire, P. (2000) [1970] *Cultural Action for Freedom.* Harvard Education Review. p. 40

[39] Oxford Dictionaries online, (2011) The Oxford University Press http://oxforddictionaries.com/view/entry/m_en_gb0256500#m_en_gb0256500 (accessed 16/04/2011)

In 2013 the primary definition of education in the UK is still that of *giving and receiving*, a kind of transmission between two parties of a definite commodity of knowledge. As such, education is a kind of power: if knowledge is something that can be gifted, it is also something that can be denied. Commenting on what he terms the 'hidden curriculum', Giroux writes:

> 'The question at the core of the radical problematic of the hidden curriculum is, how does the process of schooling function to reproduce and sustain the relations of dominance, exploitation, and inequality between classes?'[40]

Giroux, writing from the United States, later built on the central themes of Freire's work, calling for educators to take up the gauntlet and fight the governing powers that define and limit the educative agenda in this country.[41] In *Theory and Resistance in Education: Towards a Pedagogy for the Opposition*, Giroux shapes his argument around the idea of pedagogy as social activism:

> 'For teachers, education points to the need to work with adults around issues directly relating to their lives, their cultural capital. It means acting not simply as teachers, but as citizens, or, if you will, as "radical educators", struggling to establish a social and economic democracy.'[42]

Drawing heavily from two of Bourdieu's cultural frameworks, *cultural capital* and *habitus*, Giroux proposes a pedagogical approach that is not only engaged with the socially and culturally specific background of participants, but that also actively pursues an idealistic agenda of social equality. Giroux's model of Critical Pedagogy was an attempt to develop a set of critical tools which could be used to scrutinise the education process and to create new models targeting ingrained inequalities. He comments:

---

[40] Giroux, H. A. (2001) [1983] *Theory and Resistance in Education: Towards a Pedagogy for the Opposition.* Bergin and Harvey. London.
[41] *Ibid.* p. 56
[42] *Ibid.* p. 239

‘Eventually, the phenomenological variant of the new sociology of education was challenged by critical analyses that argued that the real determinants of social control and change lay not inside the typifications and consciousness of teachers but in the political and economic structures of the larger society. In other words, the concern for human agency and transformative consciousness gave way to analyses of how schools function as institutions designed to reproduce the logic of domination and inequality.’[43]

Within this thesis, Critical Pedagogy occupies a dual role. Its core philosophy of drawing out the issues of power and control in education through the analysis of underlying systems and structures of meaning is practically applied throughout. Over the course of three case studies, I examine the structures and systems which control the curriculum, particularly with regards to the way the experience of World War II effected both psychological and material approaches to teaching. The evolution of Critical Pedagogy as a recognised theory of education was contemporaneous to my final case study which examines the protest and resistance which took place at Hornsey College of Art in May 1968, while similar protests raged worldwide. I re-examine Hornsey in light of how the issues of staff control, social inequality within the pedagogical structure and limited student agency created the tensions which led to protest.

Particularly relevant to this study is Giroux’s notion of ‘border pedagogy’, outlined in his 1991 article *Border Pedagogy and the Politics of Modernism/Postmodernism.*[44] As noted previously, the subject of postmodernity in the art school has often been overlooked in favour of the earlier incendiary influence of avant-gardism.[45] However, the post-war models of pedagogy examined herein disrupt this notion of high modern

[43] Giroux. *Op Cit.* (1983) p. 74
[44] Giroux, H. A. (1991) “Border Pedagogy and the Politics of Modernism/Postmodernism*”. Journal of Architectural Education.* Vol. 44, No. 2. (Feb., 1991) pp. 69-79
[45] Madoff. *Op. Cit.* (2010).

practice in the school of art, highlighting instead models of collective and open-ended interaction, exercises designed to give equal and unsurprising outcomes, mechanisms of pedagogy which were designed to systematise the training student body and organise what it produced. Over the period of 1945 to 1970, radical and experimental models of art education were developed which dissolved the high modern and left, eventually, a far more open model of practice. Giroux writes:

'…I advance the most transformative aspects of this version of critical pedagogy by articulating a theory of what I call a border pedagogy of postmodern resistance. In this perspective, the issue of critical pedagogy is located within those broader cultural and political considerations that are beginning to redefine our traditional view of community, language, space, and possibility. In short, border pedagogy acknowledges the shifting borders that undermine and reterritorialise configurations of culture, power, and knowledge, and links pedagogy to a more substantive struggle for a democratic society.'[46]

Giroux's 'Border Pedagogy' echoes a broader interdisciplinary concern with the issue of connectivity in postmodernity – the territories we negotiate and inhabit, on physical, psychological and cultural levels. This drew in cultural studies, sociology, organisational science and the arts. In Jean-François Lyotard's seminal text *The Postmodern Condition,* he made the following observation:

'A *self* does not amount to much, but no self is an island; each exists in a fabric of relations that is now more complex and mobile than ever before. Young or old, man or woman, rich or poor, a person is always located at "nodal points" of specific communication circuits, however tiny these may be.'[47]

The classical sociological problem of structure and agency is therefore integral to the postmodern dissolution of grand narratives and focus on individual subjective action. Lyotard's 'communication circuits', however, signify interconnectivity. We are all, throughout our social lives, exposed to existing structures of meaning and action which

---

[46] *Ibid.* p. 72
[47] Lyotard, J. F. (1984) [1979] *The Postmodern Condition* Manchester University Press. Viewed online 11/12/12 at: http://www.marxists.org/reference/subject/philosophy/works/fr/lyotard.htm

define (and limit) our behaviour. Giroux's border pedagogy operates on the basis of a culture of shifting meanings and priorities, but as noted, his strain of Critical Pedagogy also drew in Bourdieu's concept of *habitus;* structures of meaning which both 'generate and organise' practices.[48]

Sociological theories of structure and agency evolved into network theories and Actor Network Theory in postmodernity. In Giroux's conception of postmodern pedagogy, he writes:

'Students must engage knowledge as border-crossers, as persons moving in and out of borders constructed around coordinates of difference and power. These are not only physical borders; they are also cultural borders historically constructed and socially organised within rules and regulations that limit and enable particular identities, individual capacities, and social forms. Border pedagogy decenters as it remaps. The terrain of learning becomes inextricably linked to the shifting parameters of place, identity, history, and power.'[49]

While this conception of postmodern pedagogy as a constantly shifting territory is in line with broader notions of postmodernity as a period of cultural instability, there is also the suggestion that a positive, engaged and proactive approach to learning is the best way to negotiate inequalities. In drawing together his argument, Giroux offers a positivist view on the potentialities of postmodern pedagogy to create hope, writing:

'The task of modernity with its faith in reason and emancipation can perhaps renew its urgency in a postmodern world, a world where difference, contingency, and power can reassert, redefine, and in some instances collapse the monolithic boundaries of nationalism, sexism, racism, and class oppression. In a world whose borders have become chipped and porous, new challenges present themselves not only to educators but to all those for whom contingency and loss of certainty do not mean the inevitable triumph of nihilism and despair but rather a state of possibility in which destiny and hope can be snatched from the weakening grasp of modernity.' [50]

---

[48] Bourdieu, P. (1990) *The Logic of Practice*. Polity Press.
[49] Giroux. *Op. Cit.* (1991) p. 72
[50] Giroux. *Op. Cit*. (1991) p. 79

The essential positivity of this statement stands at odds with the identity of postmodernism as a kind of end-point for the systems of knowledge which underwrote culture and gave it meaning. In his 2006 article *Lyotard, Nihilism and Education,* Michael A. Peters explores Lyotard's position on nihilism with regards to his position on the production of knowledge in *The Postmodern Condition,* writing that:

> 'European nihilism for Lyotard is represented most clearly in the process of cultural disintegration symbolised most clearly by the end of metaphysics, or, more correctly, the end of philosophy as the universal metalanguage – as that master-discipline able to underwrite all claims to knowledge and, thereby, to unify the rest of culture.'[51]

The loss of universal language and the incredulity directed towards the grand narrative led to a lack of unity and direction in culture, according to Lyotard; however, for Giroux the same dispersal and dissolution still offers positive opportunities for development. It is, he argues, a different world to negotiate but one in which 'hope can be snatched from the weakening grasp of modernity'.[52] Giroux's position is taken here, in the sense that I will be drawing out the continuance of positive creative production, exploration and development in the art school after the war, rather than subscribing to the nihilistic model of postmodern and post-war culture.

In order to give the dynamics of power within British art education its full context, I will next review the development of the national policies which fed into teaching within the schools of art. In doing so I will draw out the values, both social and economic, which directed the ways in which art and design subjects were taught in the twentieth century.

---

[51] Peters, M.A. (2006) "Lyotard, Nihilism and Education". *Studies in Philosophy and Education.* pp. 303-314. p. 309

[52] Giroux. *Op. Cit.* (1991) p. 79

v) The Dynamics of Power in Art Education Policy: Economies of Production and the Context for the DipAD

Here I review the documents and policies which forged the development of the British school of art in order to trace a key problem at the heart of the post-war period of art school production – the relative value of art and design disciplines and the concept of academic weighting. The policies and documents behind the last 150 years of British art training reveal an economically-driven philosophy underpinning the inception of schools of art, rather than an investment in the production of culture. The majority of UK art schools, Central and Hornsey included, were created in order to meet the needs of industry; the founding philosophy being that for every fine artist produced, there would be several lesser artists who would have sufficient skill to supply industry with designers.[53]

The interesting dynamic between fine art and design is at the core of British art training and has been since the foundation of many provincial schools in the nineteenth century. How art and design are structured within the curriculum – the level of interaction and shared studies, the respective values applied to each, the academic weighting of each – is at the heart of the history of higher art training. In order to fully contextualise and understand the changing identity of post-war art education, it is necessary to look at this history from the perspective of motivation: within the larger framework of state control and finance, it is possible to trace the hidden reasons that the arts continued to receive educational funding after industrialisation. This has less to do with cultural production and more to do with the place of the artist/designer in industry.

[53] Ewart, W. (chairman) (1836) *Report of the Select Committee on Arts and Manufactures.* Cambridge.

The need to widen the contextual frame for the arts to include economy was addressed by Howard S. Becker's book *Art Worlds*, which shaped the endeavour of the sociology of art through exploring and legitimising arts practices within the same Marxist field of production and consumption as any other product of society.[54] The telling opening example used by Becker is that of the orchestral performance, which, when broken down, involves the interaction of myriad systems, individuals and groups in order for the performance to take place, from the manufacture of strings to the education of musicians, the marketing of the performance, the creation of a system of notation, the social development of an audience capable of appreciating the product - an almost endless list of large and small developments that lead to the end product. In the arts, the single figure of the composer renders the rest of these factors almost invisible, the artist-creator figure of modernity still dominating the form of critical and historical writing. He writes:

'...we can think of an art world as an established network of co-operative links among participants.'[55]

The creative act is the point of convergence where all these interacting systems and actions meet, but Becker's text takes as its focus the collective systems that result in the creative act, rather than the individual act itself.

Since *Art Worlds* was published in 1982, Marxist approaches to Art History abound. However, there has been little work undertaken to place the vital institutions and agencies that train artists within a broader context of economies of power. Goldsmiths College and the Brit Art generation have received the most sustained attention,

[54] Howard S. Becker, 1982, *Art Worlds,* University of California Press, London
[55] *Ibid.* pp. 34-35

particularly with Julian Stallabrass in his 2006 book *High Art Lite: The Rise and Fall of Young British Art.*[56] Examining the YBA phenomenon in a post-recession context, Stallabrass offered a view of YBA as an appealingly cheap and populist commodity for a flagging art market.

Goldsmiths, as the training ground for the majority of the YBA generation, comes under some scrutiny as the launching point for a commercially-driven generation to offer up their new brand identity to the market. Stallabrass's cynicism and the value-judgements he makes about the quality and depth of the work belies the bare fact that the art market has never operated with pure values and integrity – the Goldsmiths generation simply worked the system to the best of their ability. Furthermore, the issues of economy and cultural production form the dynamic of control behind every art institution – including the school of art. The changing status of fine art and design subjects over the course of the art school's history is tied to this dynamic – the commercial and the philosophical, the market-driven and the self-reflexive.

This conflict was present from the foundation of the majority of British art schools. The nineteenth century saw swift developments in industry and manufacture and the skills of artists were vital to these developments. In 1836 the *Report of the Select Committee on Arts and Manufactures* was commissioned and published. The terms of reference were as follows:

'Ordered, that a Select Committee be appointed to inquire into the best means of extending a knowledge of the ARTS and of the PRINCIPLES OF DESIGN among the People (especially the Manufacturing Population) of the country; also to inquire into the Constitution, Management and Effects of Institutions connected with the Arts.'[57]

[56] Stallabrass, J. (1999) *High Art Lite: The Rise and Fall of Young British Art.* Verso. London
[57] *Ibid.* (1836)

As well as suggesting that access to art collections needed to be free and more widely available, the report also suggested the formation of a school of design that was aimed directly towards art in manufacture. They found the academies lacking, stating that:

‘Unless the Arts and Manufactures be practically combined, the unsuccessful aspirants after the higher branches of the Arts will be infinitely multiplied, and the deficiency of manufacturing-artists will not be supplied.’[58]

This implies that the academies prepared students only for the practice of fine art, for which some of them would, inevitably, find themselves unsuitable. There is the implication here that these individuals could be the source of much-needed artists for the manufacturing industry – if suitable training was available.

Over the course of the nineteenth century, moves were made towards the provision of adequate design education – following the *Report of the Select Committee on Arts and Manufactures* a new body called ‘the Government School of Design’ was formed. This institution went through various evolutions from this date and it is now the Royal College of Art. Twelve years after its inception, a select committee chaired by Thomas Milner Gibson found that because art was not an established part of education, the school of design was spending much of its resources on the teaching of elementary skills. It was also noted that basic art skills were not necessarily a guarantee of skills in design:

‘920. Take the case of the man who could draw a rose beautifully, so that the perspective was in every respect observed, and he should be able to represent the rose so that it would be a beautiful rose on paper; does it follow as a matter of necessity that that man would be able to draw a rose calculated for a design upon a particular subject; could he give it that representation which made it adapted for an ornament so as to be suited for the purpose of the subject? – He would have to study the means of adapting it to a new purpose.’[59]

---

[58] *Ibid.* (1836)

[59] Gibson, T. M. (chair) (1849) *Report of the Select Committee on the Government School of Design.*

These nineteenth century moves towards the provision of education solely directed towards design were the beginnings of the separation of art from design into two distinct areas, as they are today – the word design may have its roots in the Italian *disegno* (graphic invention) and French *dessin* (drawing), but our modern understanding of it would certainly be viewed as the supply of artistic and creative skills to industry. A department of practical art was created in 1853, and it put in place the teaching of elementary form and colour before being swallowed by the creation of the 'Department of Science and Art' the following year. This department was created with the issue of arts and manufacture in mind, and went about further developing basic art education in public schools. In 1864 a committee was called to inspect the distribution and uses of funding to the art schools.[60] Then, in 1884, the Samuelson report (Report of the Royal Commission on Technical Instruction) was called to:

'Inquire into the instruction of the industrial classes of certain foreign countries in technical and other subjects for the purpose of comparison with that of corresponding classes in this country; and into the influence of such instruction on manufacturing and other industries at home and abroad.'[61]

There was a feeling that much could be learned from the French when it came to the full exploitation of art in industry. Design was, therefore, treated as a by-product of the higher branches of art.

In the twentieth century, art education became the subject of scrutiny and development based on and around the notion of self-expression, something which can be read as part of the broader focus on the individual psyche and on personal development which evolved following the horrors of trench warfare and its cultural and social legacy.

[60] Northcote, S. (chair) (1864) *Report of the Select Committee on the Schools of Art*
[61] Samuelson, B. (chair) (1884) *Report of the Royal Commission on Technical Instruction (The Samuelson Report)*

Although in the 19th century there had been a focus on design skills in establishing art as an element of tertiary education, over the course of the twentieth century there was renewed interest in education as a social project – as a humanist project of social improvement. The Department of Science and Art was swallowed by the Board of Education, which was established in 1902. Art was treated in the context of a broader education by the board – part of a more holistic approach to schooling.

Over the following fifty years, art gained contemporary currency as a school subject through the belief that expressiveness was essential to a child's development – and that art was an opportunity for free expression. When located in early twentieth century psychological and pedagogical beliefs, the impact of psychoanalysis on both the development of curriculum and the role and function of art is clear. The individual was seen as the locus of creativity and discovery – and within the school, the child as individual must be given the chance to express and explore. In the period between the first and second world wars, there were numerous reforms made to art education in schools, with each report moving further towards the art room as a place for individual development and expression. They included *The Education of the Adolescent*,[62] *The Primary School'*[63] and *Secondary Education*.[64] Reforms reflect both the new approach to psychology, and also a grass-roots approach to social change. They also, however, located art practice and viewing within a system of expression and individualism. Art education today - in schools, colleges, and universities - operates under this same liberal principle.

[62] Hadow, H. (chair) (1926) *Report of the Consultative Board of Education: The Education of the Adolescent (The Hadow Report)*
[63] Hadow, H. (chair) (1931) *Report of the Consultative Committee: The Primary School.*
[64] Spens, W. (1938) *Report of the Consultative Committee: Secondary Education* (*The Spens Report)*

The art/design training provision experienced a further period of intense scrutiny in the later interwar years. The *Report of the Committee on Advanced Art Education in London* (The Hambledon Report) of 1936 argued for a better correlation between the Royal College of Art and other institutions of similar standing such as the Slade, the Courtauld and the Central School, which was deemed 'University standard'.[65] Within the report the RCA came under much criticism and it was suggested that the Central School of Arts and Crafts was a stronger contender to be the national centre for applied arts. A decade later new qualifications were formed – the Intermediate Examination in Arts and Crafts, and the National Diploma in Design. A pamphlet released by the Ministry of Education after these reforms stated that:

'The art school deals with a group who are in the main very much like any other group of young people, but it is certainly true of students in art schools as those in any other kind of school that they will vary greatly in temperament and outlook and that too much thought cannot be given to their individual idiosyncrasies by those who are put in charge of them. The "genius" who is "born but cannot be made" is bound to crop up from time to time in art schools, as in other institutions, and it will be the duty of the school to recognise him when he appears, to give him the best opportunity he can be given in that school and to see to it that he is passed on to a more advanced institution for further study when necessary. But the main business of any school is to cater for the average student.'[66]

This is a vital swing in approach to the fine art curriculum. When the RAA was founded, its object was to train talented individuals in the fine arts; the cultivation of genius was its raison d'être. In this 1946 pamphlet, the Ministry of Education suggested that education should not be focusing on the isolated genius, but rather on collective levels of knowledge, skills and advancement. When the Intermediate Diploma was introduced, it replaced the traditional drawing exam with eight new tests, which incorporated skills in both art and design: drawing from life, drawing and

---

[65] Viscount Hambledon (chair) (1936) *Report of the Committee on Advanced Art Education in London (The Hambledon Report)*
[66] Ministry of Education. (1946) *Pamphlet No. 6 'Art Education'.* Ministry of Education.

painting from memory and knowledge, anatomy, architecture, drawing the figure in costume, creative design for craft, modelling and general knowledge.[67]

These tests reflect a new approach to art training that crystallised the concern for art industries that had been prevalent since the mid-nineteenth century – they required students to achieve set standards in both traditional fine art disciplines and in design disciplines that could lead to work in manufacture and industry. The National Diploma in Design followed a similar pattern, although it did allow candidates to select their own specialism. Candidates had to choose either one subject from list A or two subjects from list B. In 1946/7 the choices were as follows:

'<u>List A:</u> Dress; furniture; glass making and decorating; gold and silver-smithing; Illustration; interior decoration; modelling and sculpture; painting; painting and decorating; pottery; printed textiles (hand and machine); knitwear; lace.

<u>List B:</u> Book-binding; die-sinking; embroidery (hand); embroidery (machine); Enamelling; Engraving on metal; inlay; marquetry or veneer; jewellery; letter cutting; lettering; writing and illuminating; light metal work; lithography; mosaic work; printed textiles (hand); printed textiles (machine); process reproduction; stained glass; Terra Cotta work; typography; wallpaper design; woodcarving; woven textiles (hand); woven textiles (machine); carpet weaving; cast iron work; fabric knitting; gesso work; lace (hand); lace (machine); lacquer work; lead work; leather work; linoleum; plaster work; rug weaving (hand), shoe design; shop display; stone carving; tapestry weaving (hand); wrought iron work.'[68]

Many of these identified subject areas are practical: many were likely to lead to employment. Additionally, giving students the choice between specialised skill sets was a move in the direction of the contemporary modular system. Art education was moving in the direction of vocational training, as well as towards providing students with a recognisable qualification. This was enhanced by the Bray Report of 1948.

---

[67] Ashwin, C. (1975) *Art Education: Documents and Policies 1768-1975.* SRHE. London.
[68] *Ibid.* (1975)

Chaired by Mr F. Bray, the Committee on Art Examinations were set terms of reference that instructed them to look at systems of assessment in art, with the view to replacing them with internal examinations moderated by external assessments. The report recommended this system, but it also made clear that standards and facilities within art institutions themselves would need to be properly moderated and assessed. The Bray report had a duel effect, firstly in introducing general standards: both for art colleges to attain in order to be allowed to run courses and for art students to attain in order to pass these courses. It also, however, gave art schools freedom to design their own courses, in line with these requirements. This is the peculiar balance that art schools retain today – both creatively autonomous and yet under the control of legislation and external assessment. As a result of the Bray Report, the National Advisory Committee for Art Examinations was formed in 1951, chaired by F. L. Freeman and otherwise known as the Freeman committee.

Over the course of the 1950s, The Freeman Committee suggested further moves towards college autonomy, including the proposition of allowing the stronger art colleges to design their own courses and set their own examinations. On the surface, this may seem like complete autonomy – but as long as art colleges taught courses that were intended to lead to the same qualifications, complete autonomy was impossible; it was a balance between academic standardisation and the inherent individualism of art practice.

In light of the proposals made by the Freeman Committee, the Ministry of Education decided that every aspect of higher art education needed to be assessed, debated and reformed. This led to the formation of the National Advisory Council on Art Education (NACAE), chaired by Sir William Coldstream. The Hornsey chapter of the story began in 1960 when the NACAE released their first report, commonly known as the first Coldstream Report. The report made extensive reforms to the higher art education system in Great Britain and introduced a new qualification: the Diploma in Art and Design (DipAD). This qualification was designed to offer art and design students something approaching a degree-equivalent qualification. Over the course of the 1960s, necessary arrangements were made and the new courses began to run. By the late 1960s, the first batch of students had experienced the new DipAD and there was some dissatisfaction about it.

During the meetings of the board, there had been great debate between members as to how best an art school could function for the future progression of art and design. There was disagreement; factions formed and the report itself was the product of compromise. The Coldstream board had amongst its number the old guard, including Coldstream himself, whose teaching methods followed the traditional academy structure they had experienced themselves as trainees. However, Victor Pasmore, Richard Hamilton, Harry Thubron and Tom Hudson were also board members, and they argued for a training that would focus on process and material, pushing the strains of Basic Design ideology which they had successfully developed at King's College, University of Durham and Leeds College of Art respectively. Although both Pasmore and Coldstream had previously been members of the Euston Road School, they had differing opinions on how fine art should be taught. During an interview with Lynda Morris in 1985, Coldstream himself commented:

'You should remember that I was only the chairman of the Coldstream Report….It should have been called the Pasmore Report, then people would have understood what was happening.'[69]

Pasmore's vocal contributions saw the introduction of a foundation year for prospective DipAD students, as well as a concentrated period of broad study within the DipAD prior to subject specialisation. The concept of specialisation was given a new underpinning of core skills or values, not only in terms of practice. Art and design study was also to be placed within the context of a broad, liberal education involving other disciplines, as well as Complementary Studies (akin to general studies, and not limited or clearly defined by the report), and Art History. Both Complementary Studies and Art History were made into compulsory subjects, which were to be assessed. The idea of the provision of 'a broad context' in the report evidently derives its philosophy from Basic Design with its echoes of Bauhaus philosophy. We can, perhaps, attribute the insistence on the learning of 'fundamental skills and disciplines which underlie and sustain any form of specialization' to the traditionalists. The report noted that:

'We have interpreted (i) to mean that the diploma courses must be of sufficient breadth and significance to give art students an education with the equivalent discipline and the same sort of stimulus as a university course should give to an undergraduate.'[70]

It was also noted that this new University-level qualification might be unsuitable for all applicants, in light of the plan to introduce entry requirements of A-levels and a newly-conceived foundation year. The NACAE dealt with this problem by suggesting the introduction of a selection of full and part-time 'vocational courses'. These courses were extremely similar to the DipAD – only the students taking it lacked sufficient

---

[69] Morris L. *The Impersonal Eye of the Camera*, http://thehornseyproject.omweb.org/modules/wakka/LindaMorrisPaper accessed July 2007
[70] Coldstream, W., Chairman. (1960) *First Report of the National Advisory Council on Art Education (The First Coldstream Report)*, NACAE. London.

grades to qualify for the DipAD. The new division in the schools, which had formerly taken on students on the merit of artistic ability alone, was noticeable and resented.

The suggested reforms contained by the first Coldstream report were all approved and, over the next five or six years, they were implemented. Colleges that wished to offer the DipAD had to do substantial preparation and submit their course designs to the newly formed National Council for Diplomas in Art and Design, chaired by Sir John Summerson. This board received applications and sent inspectors to the colleges in order to assess their suitability. The majority of colleges were found unsuitable. Many lacked adequate library facilities for the newly academic fine art course and studios were found to be scattered and badly appointed. There was poor provision of seminar space, nowhere for lectures to take place, no room for the new Art History and Complementary Studies classes. The NCDAD issued a report in 1964, known as the Summerson report, which explained that:

‘The quality of teaching staff was deemed generally high, and art school accommodation and facilities generally poor. Libraries were badly housed, tutorial rooms were rare, and lecture rooms often unsatisfactory. Trouble was had finding suitably qualified staff to teach history of art.’[71]

Amongst the small number of institutions that secured approval was Hornsey College of Art. At the time, it was one of the most fashionable and highly regarded schools of art in the country, although it also retained a strongly local attendance. Over the few years following the Coldstream report, it changed beyond recognition. In line with the report, it introduced the foundation year and entry requirements and it altered its curriculum to encourage early specialisation and the inclusion of history and

[71] Summerson, J. (chair) 1964) First Report of the National Council for Diplomas in Art and Design *(The Summerson Report),* NCDAD

complementary subjects. The division between the DipAD and the vocational courses split the student body apart, and a noticeable class divide emerged as middle class students were accepted to the DipAD. It was this moment in policy development which resulted in the events that make up the final case study of this thesis – the sit-in at Hornsey College of Art. Against the backdrop of incendiary politics, liberal values and an ever-growing youth culture, the question of power, control and authority within art education because the subject of criticism, protest and eventual reform. As this thesis will explore, many of the issues around power and control evolved from conceptual engagement with communication technologies during the post-war years, which is why technology and systems are at the heart of this study.

vi) Technology in Art and Post-War Pedagogy

Technology occupied its own place in the post-war cultural landscape, beyond that of the physical relic; it was a bridge between the memory of war and the continuously evolving material culture of the post-war years. This was due to the level of invention and discovery in the biological and physical sciences during the war, which could not be undone. The important advances in engineering and computing continued to be used and developed over the course of the century. The objects and physical environments which became absorbed into art-school pedagogy between 1945 and 1970 derived principally from the machines, systems and mechanisms of war. The materiality of engineered weapons, communication devices and machines meant that they formed a continuous and evolving legacy of the war. They were visible, tangible and present in post-war culture. Technological advancements of war operate outside of the theories of cultural eradication that they in themselves apparently provoked, or certainly informed.

In *One Way Street*, Walter Benjamin's meditation on the trauma of World War I, he writes:

'Human multitudes, gases, electrical forces were hurled into the open country, high-frequency currents coursed through the landscape, new constellations rose in the sky, aerial space and ocean depths thundered with propellers, and everywhere sacrificial shafts were dug in Mother Earth. This immense wooing of the cosmos was enacted for the first time on a planetary scale, that is, in the spirit of technology. But because the lust for profit of the ruling class sought satisfaction through it, technology betrayed man and turned the bridal bed into a bloodbath. The mastery of nature, so the imperialists teach, is the purpose of all technology…technology is not the mastery of nature but of the relation between nature and man.'[72]

This collision of technology with nature highlights the particular and troublesome place of technology in the history of warfare – its damage is both physical and psychological and its presence persists. Technology is mankind's way of harnessing and applying the laws of nature and over the course of the twentieth century, mechanical engineering fused with the physical and biological sciences in the creation of increasingly complex weaponry, communication devices and organisational structures. Benjamin describes a kind of betrayal in the resulting violence, which 'turned the bridal bed into a bloodbath'. This account of technology makes it the cause of fear and loss, charges it with the enormous and then unmatched human devastation caused by World War I. Benjamin continues:

[72] Benjamin, W. (1979) "One Way Street" (1925-26) *One Way Street and Other Writings.* Trans. by Jephcott, E. and Shorter, K. New Left Books. London. pp. 103-104.

'The paroxysm of genuine cosmic experience is not tied to that tiny fragment of nature that we are accustomed to call "Nature." In the nights of annihilation of the last war the frame of mankind was shaken by a feeling that resembled the bliss of the epileptic. And the revolts that followed it were the first attempt of mankind to bring the new body under its control. The power of the proletariat is the measure of its convalescence. If it is not gripped to the very marrow by the discipline of this power, no pacifist polemics will save it. Living substance conquers the frenzy of destruction only in the ecstasy of procreation.'[73]

Benjamin talks of technology as a new, independent power, presenting it as something that is *animate*, even alive. This can be interpreted on two levels – firstly, because at the time of Benjamin's writing, technology was simply a system created to perform a function, and it became animated through human operation. Secondly, technology harnesses the power of nature; it uses energy and motion, velocity and interacting systems, to create results. The menacing power of engineered weapons and transport is dependent on operation, but despite this in its own right it gained a symbolic terror that was stronger and more deadly than mankind. The issue was the sheer potential destructive power of technology, coupled with the fear that it may not be controlled.

In Frederic Jameson's meditation on postmodernism, capitalism and the technological eras of mankind, *Postmodernism, Or the Cultural Logic of Late Capitalism*, he writes:

'We may therefore speak of our own period as the Third Machine Age; and it is at this point that we must reintroduce the problem of aesthetic representation already explicitly developed in Kant's earlier analysis of the sublime, since it would seem only logical that the relationship to and the representation of the machine could be expected to shift dialectically with each of these qualitatively different stages of technological development.'[74]

While Jameson's account was problematically forged around the idea of distinct ages of technological development, it did create vital links between technology, economy

[73] *Ibid.* p. 104.
[74] Jameson, F. (1991) *Postmodernism, Or the Cultural Logic of Late Capitalism.* Duke University Press. Durham, NC. p. 35

and cultural production. Moreover, as he notes above, these changes are mirrored by changes in the representation of the machine too. In the case studies presented herein, the machine is not only explored within visual arts education, but it also becomes media, pedagogical model, performance, communication philosophy and symbol. It traverses boundaries between production and meaning, reflecting both the impact communication technologies had on methods of art production and the issues the same technologies created for cultural values. Jameson comments that:

'…technology may well serve as adequate shorthand to designate that enormous properly human and anti-natural power of dead human labor stored up in our machinery-an alienated power, what Sartre calls the counterfinality of the practico-inert, which turns back on and against us in unrecognizable forms and seems to constitute the massive dystopian horizon of our collective as well as our individual praxis.'[75]

His descriptions of the alienating power of the machine – its capacity to replace human work but its lifelessness – also echoes Benjamin's description of technology as a new body to be controlled, mechanical yet animate. In the context of World War II technologies, the machine was animate to an extent never achieved before, capable of independent calculations and processes to which dystopian nightmares of the automaton are profoundly connected.

On the postmodern age of machines, Jameson writes of a technology which is ingrained with capitalist power and control:

[75] *Ibid.* p. 34

'Rather, I want to suggest that our faulty representations of some immense communicational and computer network are themselves but a distorted figuration of something even deeper, namely, the whole world system of a present-day multinational capitalism. The technology of contemporary society is therefore mesmerizing and fascinating not so much in its own right but because it seems to offer some privileged representational shorthand for grasping a network of power and control even more difficult for our minds and imaginations to grasp: the whole new decentered global network of the third stage of capital itself.'[76]

Given that the networked technologies of the postmodern age evolved from the technological advancements made during the war, there is another layer to this 'network of power and control'. World War II was a war of machines, and the development of 'thinking machines' – computerised weapons and devices which could read information and make calculations without physical manipulation – gave rise to the heyday of science fiction, much of which predicted the new developments which subsequently took place in technology. Over the same period, machines were integrated into modern life and the sophisticated developments in computing opened new worlds of possibility; a world where machines could perform calculations beyond the capabilities of their makers was born.

Technological development in the post-war years did not just affect the means of cultural production; it broadly changed communication, language, symbolism and social interaction. The case studies that follow draw out the ways in which art school teaching explored the cultural and social significance of technology after the war and how this linked to the dynamics of power concealed within arts pedagogy.

[76] Jameson. *Op. Cit.* (1991) p. 37

vii) Case Study Outlines

My Basic Design case study first looks at the origins and development of the movement, with the particular aim of re-establishing, and assessing, the little-acknowledged roots of the movement at the Central School of Art and Craft. Using a number of unpublished resources from the William Johnstone archive at the National Library of Scotland, the chapter traces the early work of Johnstone and examines attitudes and ideas shared between him and his staff. It will trace the vital importance of Johnstone's interdisciplinarity in the evolution of Basic Design as well as examining the significance of Central's growing focus on Industrial Design in the post-war period.

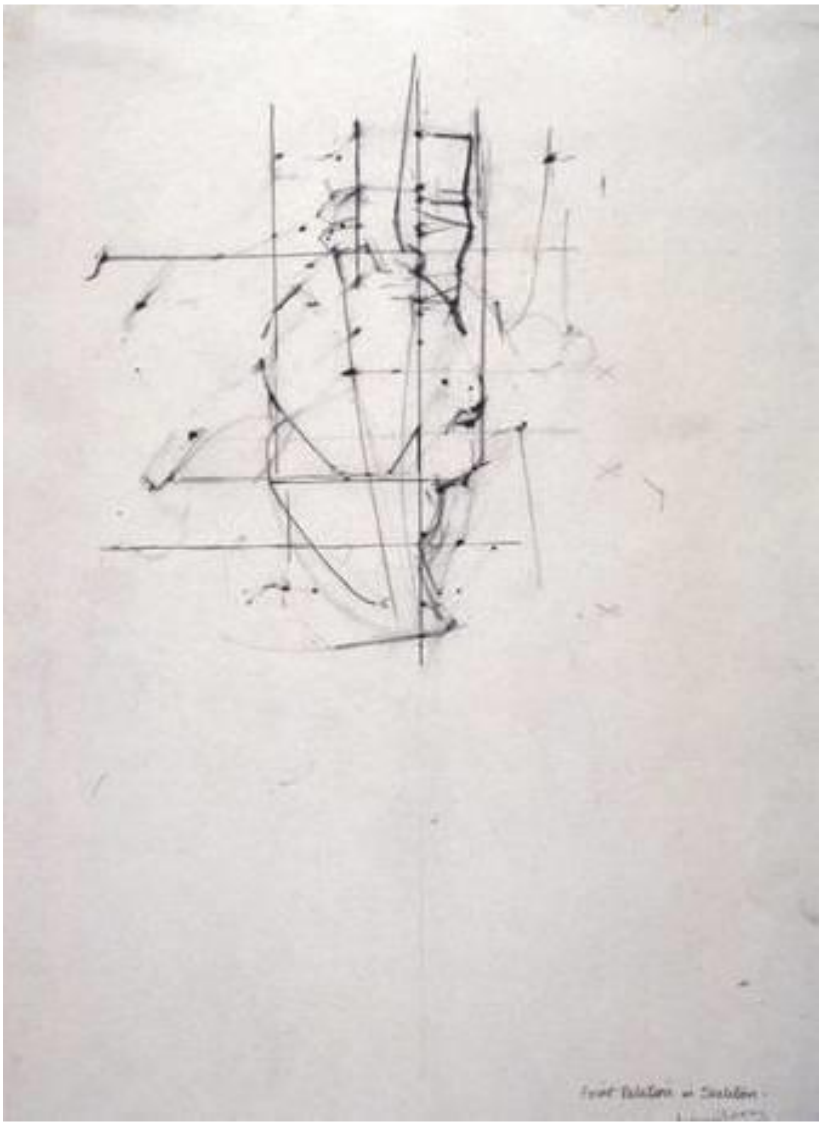
I then address the scientific and philosophic relationship between biology, systems and the machine in the post-war years and explore how systems thinking was apparent in the pedagogy of Basic Design. I examine the ideological development of Richard Hamilton, who created the most systems-oriented pedagogy of all Basic Design staff. I establish the crucial importance of the fusion of biology and technology in the period, particularly how approaches to teaching biological form in the art school reflected an underlying systems ideology. Finally, I look at how World War II technologies created a complex link between human biology and the machine, resulting in new Gestalt theories of perception and early cybernetics. As well as looking at the fear of science and technology of the post-war years and national attempts to counterbalance this fear, it also traces how the wartime experiences of 'thinking' technologies manifested themselves in Basic Design pedagogy.

My second case study Groundcourse has two sections, the first of which provides a context to the development of foundation courses in the UK after Basic Design and the first Coldstream report, a process that was contemporary to Ascott's first post at Ealing. I examine the national documents and policies which fed into the development of the foundation courses, particularly with reference to the new DipAD and the gap between secondary-level art and the art school. Many of the courses which emerged were influenced by the Basic Design movement, but others, like Ascott's, became the basis for pedagogical experiment. The origin and development of foundation courses have received little critical attention and I examine their early development here because this is vital to understanding how a course as radical as Groundcourse was able to develop. The second half of the chapter will examine Ascott's development from his own studies at King's College to his post at Ealing against this context of higher art education policy changes of the 1960s.

In the second section I deal with the specific ideological issues around Groundcourse. I first look at the link between cybernetics and the Cold War and how Ascott's formative experiences in the Air Force manifested themselves in his pedagogical practice. I then examine the exercises taught within the Groundcourse curriculum and their cybernetic origin, before considering the way the course used psychological conditioning as a method of student development. Finally, I consider the philosophical problem of control and freedom within Ascott's systems approach to pedagogy and why, by the end of the decade, these approaches receded into history.

My final case study on Hornsey College of Art looks at the issues of power, control and policy which led to the sit-in at the college in May 1968. I look at the ways in which evolving national policies tie to issues of economy and production, particularly with regards to the art/design distinction. I then look at the specific pedagogical issues at Hornsey which created the conditions for protest, examining in particular the power dynamics between staff and students the inequalities caused by the introduction of the Diploma in Art and Design (DipAD). I look at the protest as a form of pedagogy, specifically within the context of critical pedagogy and ‘culture jamming’. Finally, I look at how pedagogical structures evolved by sit-in participants referenced the previous twenty years of pedagogical development in an attempt to liberalise – and energise – the art school.

1. Basic Design



Richard Armstrong *Exercise: Point-relationship in Skeleton.* Basic Design work

1.1) Beyond the Bauhaus

Most often interpreted as a late UK reaction to Bauhaus innovations, I argue here that the Basic Design movement was also a manifestation within art and design teaching of the developing systems age after World War II and that many of the constituent pedagogical approaches were innovatory in their own right.[77] With this in mind, this case study offers four propositions:

i. The Basic Design movement was the most clearly articulated pedagogy for British abstraction of the twentieth century, with long-lasting impact upon art teaching in the UK.

ii. This pedagogy of abstraction was demonstrably shaped by the technological developments of the age and the place of the natural sciences within these.

iii. The pedagogical structures, teaching exercises, methods and ideas of Basic Design reflect a wider cultural shift towards systems thinking after WWII.

iv. While there are clear Bauhaus parallels, Basic Design needs its own distinct literature relating to its ideological, geographical and temporal distance from the Bauhaus.

There is no complete history of the Basic Design movement to date, although there are partial histories which between them offer some account of the disparate practices at the three main hubs of the Central School of Art and Design, King's College, University of Durham and Leeds College of Art, as well as the associated experimental summer schools.[78]

In this case study I will give a fuller account of the foundation and evolution of the Basic Design movement and highlight its place within the history of higher art

[77] See Williamson, B. (2008) and (2009), Yeomans, R. (1987), Walker, J. (2003) and (1987), Thistlewood, D. (1981)
[78] Richard Yeomans' unpublished PhD thesis offers a thorough account of Basic Design teaching at King's College, University of Durham. This will be reviewed alongside other critical histories herein.

education in Britain. In doing so, I will create an alternative interpretation of the ideological development of Basic Design to the accepted Bauhaus heritage, exploring instead the impact of World War II and subsequent technologies on systems of cultural production. As this case study will demonstrate, while there are similarities in terms of the curricular structure and the issues of art training and technology, the ideology – and the outcomes – of the Basic Design movement were very much of their own time.

While the Basic Design teaching practices have been the subject of limited debate, the wider cultural context for the movement has not been scrutinised in the depth it requires. To date Richard Yeomans has offered the fullest account of the movement in the form of his PhD thesis and a short book chapter which focus on the pedagogies of Richard Hamilton and Victor Pasmore.[79] These contributions were reviewed more fully in this introduction, but I want to highlight here the work Yeomans did in drawing together several important formative influences for the two educators and collecting and analysing some vital primary material. However, he did not pursue the change in cultural values which the pedagogies represented. This case study takes up this question, as well as offering a more sustained account of how the movement started and evolved.

The lack of coherence of vision between the different practitioners of Basic Design led to disjunction and confusion about whether it was indeed a movement – particularly after the debates provoked by the 1981 retrospective exhibition at the Institute of Contemporary Arts: *A Continuing Process.* The exhibition did not include the Central

[79] These documents are reviewed more fully in my literature review later in this introduction.

School of Art as a major contributor, causing friction with the former Principal, William Johnstone and focusing instead on the later developments at Leeds College of Art and King's College, University of Durham.[80] By 1981 the methods which had been employed in the basic courses met with general disfavour and there was heated debate about what characterised the movement and whether it could even be classified as such. Even Victor Pasmore himself recalled that it was:

'…necessary to understand that there was no single unified idea, system of programme for the Foundation Course developed by Richard Hamilton and myself at Newcastle, and Harry Thubron and Tom Hudson at Leeds. In fact the whole affair was an entirely empirical and experimental procedure which somehow managed to muddle together and combine collective exhibitions which gave the appearance of unity – rather like when a mass of assorted junk cars are dumped in a heap they form the unity of a pyramid…'[81]

This quote comes from a letter written by Pasmore to Richard Yeomans, who was inspired to write his PhD thesis about Basic Design at King's College after witnessing the fiery and conflicting opinions provoked by *A Continuing Process.* It should be noted that of all the Basic Design practitioners, Pasmore's style was the most intuitive and the least formalised, and this is pertinent to his own view on the movement as something that evolved in the manner of an assemblage as described to Yeomans above.

Yeomans uses the term 'Basic Design' with reserve throughout, given that the term only became commonly used after Maurice de Sausmarez's book with this title.[82]

---

[80] Johnstone's contribution to Basic Design's development at Central School of Art is discussed in detail later in the chapter.
[81] Letter from Victor to Pasmore to Richard Yeomans: quoted by Yeomans in his unpublished thesis: Yeomans, R. (1987) *The Foundation Course of Victor Pasmore and Richard Hamilton 1954-1966.* Doctoral thesis. Institute of Education, University of London. p. 9
[82] De Sausmarez, M. [1964] (2006) 2nd Ed. *Basic Design: the Dynamics of Basic Form.* A. C. & Black. London.

However, it is rare that any given movement in the arts has its collective identity due to a clear unity and structure from the outset – it is only retrospectively that the extent - and causes - of these moments of philosophical and material unity become apparent. ‘Basic Design’ is an adequate way to differentiate the movement from the ‘basic courses’ taught at the Bauhaus, but even the term ‘basic’ has its issues with regards to this connection. Figure 1, below, shows the famous curriculum ‘wheel’ diagram devised by Walter Gropius:

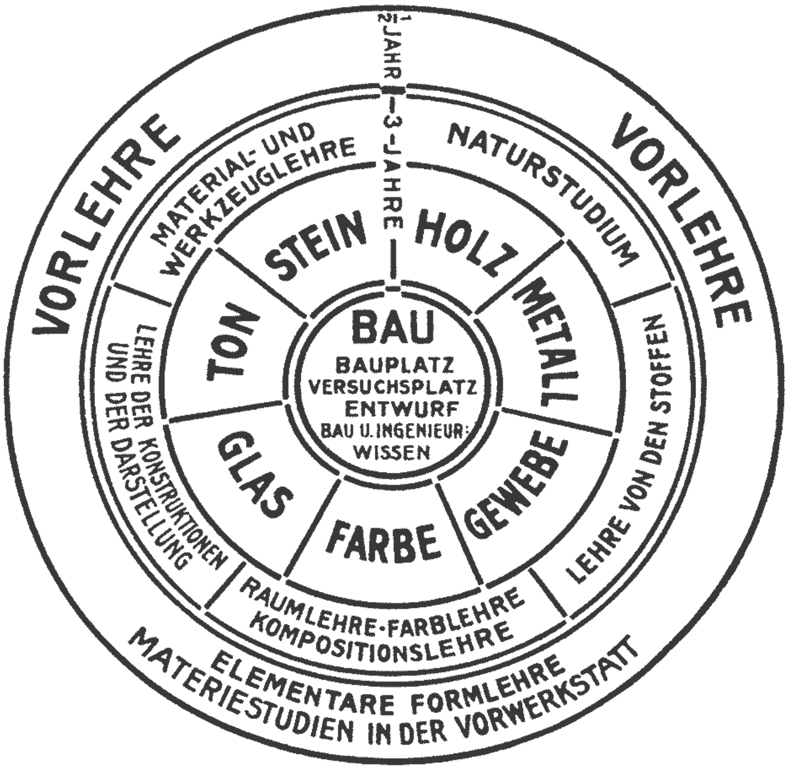


Figure 1: Walter Gropius. *Bauhaus Curriculum Diagram.* 1922.

Like the Bauhaus *vorlehre* (or pre-apprenticeship) stage, Basic Design was an introductory curriculum shared by training artists and designers which comprised of the study of what was perceived to be ‘elementary form’. Interestingly, in the widely-available English translations of this diagram, the *vorlehre* is described as a 'basic' course rather than a preliminary course which is not necessarily a clear or direct translation. In addition, while in the original diagram the content of the *vorlehre* is described as the teaching of elementary form and material studies in the pre-workshop, this is translated into English as the 'basic' workshop too.

Aside from this shared foundation year, the Basic Design movement did not subscribe to the rest of the Bauhaus *vorkurs* structure and final outcome of unity in the discipline of architecture. However, Basic Design also shared the two conflicting issues that were at the heart of the Bauhaus curriculum: individual expression versus technology. Johannes Itten had been responsible for the design of the Bauhaus *vorkurs*, the preliminary year that formed the shared base for all Bauhaus apprentices.[83] He designed it to be intuitive, expressive and based on the exploration of material qualities. Famously however, he left the Bauhaus in 1922 due to irreconcilable differences with Walter Gropius, who was convinced the future of the school lay in its connection to technology and industry and the subsequent commissions this would provide.[84] This was the year that Gropius promoted the slogan 'Art and technology, a new unity: technology does not need art, but art does need technology', replacing the former concentration on the unity of art and craft.[85]

In order to differentiate Basic Design from the Bauhaus, it is important to consider the full implications of the time lapse between the two curricula. Three decades after the

[83] Lerner, F. (2005) "Foundations for Design Education: Continuing the Bauhaus Vorkurs Vision". *Studies in Art Education.* Vol. 46, No. 3 (Spring, 2005) pp. 211-226
[84] Droste, M. (2002) [1990] *Bauhaus 1919-33.* Taschen. Berlin. p. 46
[85] *Ibid.,* p. 58

Bauhaus's closure, the Basic Design movement was characterised by the same split between the conflicting issues of technology and intuitive expression, particularly with regards to the pedagogies of Richard Hamilton and Victor Pasmore. However, what makes the Basic Design movement distinctive from the Bauhaus is what had intervened in those three decades since the Bauhaus had closed. An extreme period of technological and social change had taken place, particularly with regards to the dramatic scientific, technological and psychological developments during World War II. The speed of technological change and its symbiotic relationship with cultural change in the twentieth century means that no direct comparison can be formed between artists engaging with technology so many years apart. Moreover, the creative understanding of individual expression and the possibilities of intuition had also changed beyond measure by the post-war years, a fact that will be demonstrated by the closer scrutiny of Basic Design student work within this case study.

In a paper given at the Henry Moore Institute in November of 2009, Yeomans pointed out that:

'In the early 1950s very little was known of the Bauhaus in Britain and the only information available was the 1939 Bauhaus catalogue by Gropius and Meyer, and the translations of Klee's *Pedagogical Sketchbook* (1953) and Kandinsky's *Concerning the Spiritual in Art* ([1914] 1977) and *Point and Line to Plane* (1947).'[86]

Yeomans argues that there was limited access to printed resources about the Bauhaus and Bauhaus ideology filtered into UK practices gradually. However, despite the lack of written resources it must be acknowledged that the presence of exiled Bauhaus artists in Britain led to other forms of exchange and sharing taking place. These artists

[86] Yeomans, R. (2009) *The Pedagogy of Victor Pasmore and Richard Hamilton.* Typescript of paper delivered at the Henry Moore Foundation on Nov 4 2009: Accessed 01/11/11 at: http://www.henry-moore.org/docs/yeomans_basic_design_0.pdf.

included Gropius himself from 1934 to 1937 as well as László Moholy-Nagy and Marcel Breuer, all three of whom left for the States by the late 1930s, having struggled to find teaching posts or development opportunities for Bauhaus models of education.[87] This poor reception in Britain might well be one of the reasons why Basic Design has been so frequently represented as a delayed exploration of Bauhaus ideology.

While all teachers and course organisers behind Basic Design acknowledged the Bauhaus influence to varying degrees, it is not as important where the Basic Design practitioners got the idea of a 'grammar of art', but rather, why one was necessary at that moment in time. It is clearly evident that a 'grammar' in the visual arts is an effort towards repositioning or changing ideological goals. A kind of shared basic grammar of form could connect artists and designers to industry; it could be open, interrelated for construction/assembly, and above all, modern. As well as his later book, in 1961-2 Maurice de Sausmarez had published two articles entitled 'A Visual Grammar of Form' and 'A Visual Grammar of Form2' in *Motif* journal.[88] In 1959, Richard Hamilton wrote *Diagrammar*, a short article about his teaching methods at King's College, University of Durham which was published within *The Developing Process,* a book about Basic Design teaching at Leeds and Durham edited by Victor Pasmore and published alongside the ICA exhibition.[89] As well as these prominent articles, there are myriad references to the 'grammar', 'syntax' or 'language' of form in the

---

[87]

[88] See De Sausmarez, M. et al., 'A Visual Grammar of Form', *Motif,* Winter 1961, pp.3-29 and de Sausmarez, M. et al., 'A Visual Grammar of Form(2)" *Motif,* Summer 1962, pp.47-67

[89] Pasmore, V. et al. (1959) *The Developing Process: Work in progress Towards a New Foundation in Art Teaching as Developed at the Department of Fine Art, Kings College Durham University, Newcastle upon Tyne, and at Leeds College of Art.* Published on the occasion of an exhibition at the ICA London. King's College: Durham.

writing of the key Basic Design figures: Victor Pasmore, Richard Hamilton, William Johnstone, Harry Thubron and Tom Hudson.

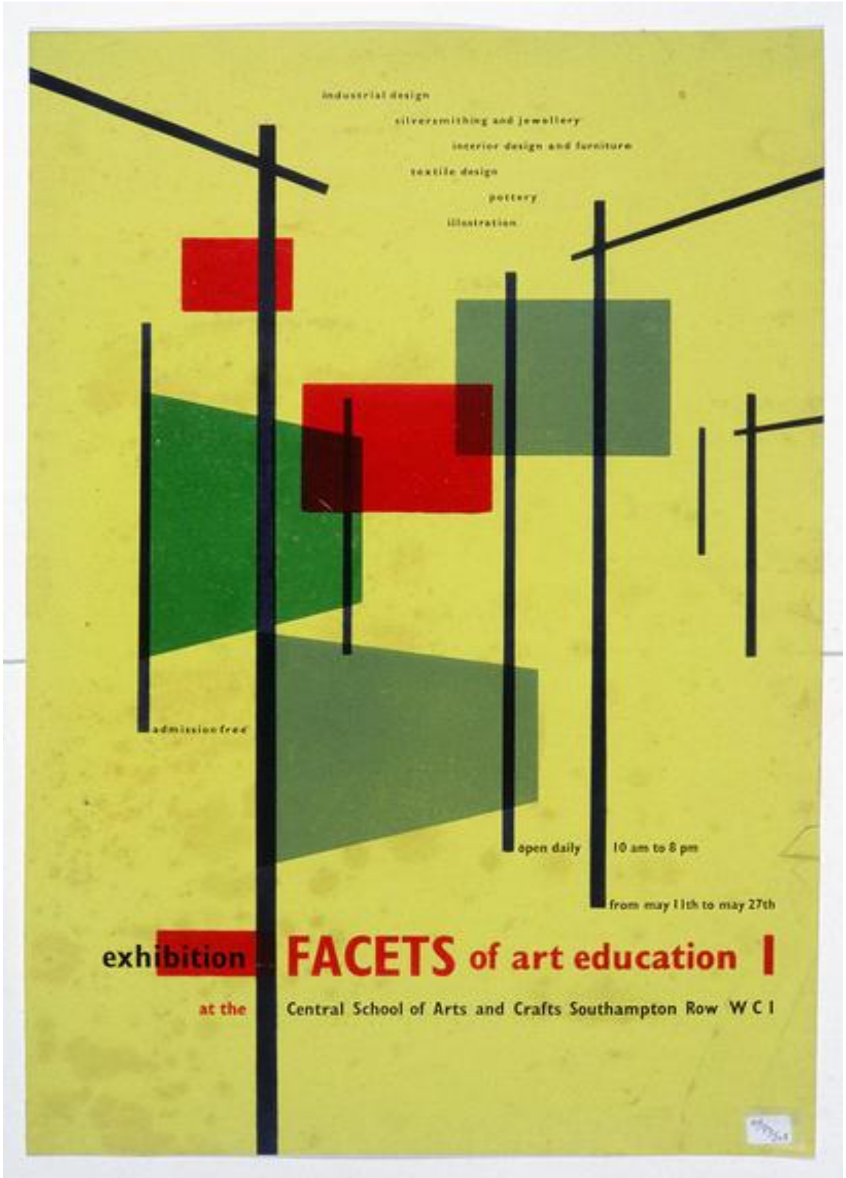
While the use of “grammar” with reference to visual art is most widely recognised as a Bauhaus inheritance it is a problematic assumption which has been further reinforced by more recent scholarship on the subject. The concept of a ‘grammar of art’ fed into the ideological structures of art teaching in the 1950s and 1960s. Basic Design education had a mechanical approach to pedagogy with clear components and processes – although outcomes did vary, they varied within a very fixed set of parameters. Science and technology both played a vital part in the language of Basic Design: that is to say in the formation of a grammar of abstraction propagated by Pasmore, Thubron, Hudson, de Sausmarez and artist-teachers across the country.

The contemporaneous pedagogical writing and notes by Basic Design practitioners shaped the movement and are part of the fabric of its history, essential in terms of understanding the ideological underpinning of abstract education. For example, Maurice de Sausmarez’s book *Basic Design* summarised a fixed set of teaching values for abstraction. He reflected the materials and processes involved, which were intended to give students the building blocks of visual language; line, form, structure, colour.[90] To create a 'grammar' for art was to emphasise that it is a discipline with defined rules and outcomes. The grammar(s) offered up by Basic Design were absolutely and demonstrably representative of their time; a post-war effort to synthesise, mechanise and modernise the art school.

[90] De Sausmarez. *Op. Cit.* (1965)

It was the underlying systemic qualities which drew its practitioners together, qualities which were experimental and distinctive. In pursuing these qualities within this case study I will demonstrate the unifying qualities which made Basic Design a movement, as well as the cultural influences which stimulated it. I will be using examples from the Basic Design teaching archive at the National Arts Education Archive, housed at Bretton Hall. The archive includes examples of student work from Leeds and Durham, allowing comparisons to be built between the contrasting approaches taken by key institutions and individuals. This study will, therefore, offer an alternative view to the Basic Design movement, grounded in its post-war technological origins.

1.2) The Origins and Development of Basic Design



i) National Art Education Policy and Basic Design

The early development of Basic Design and the factors which contributed to its evolution is a matter which has been neglected to date by the other authors on the subject as highlighted in my review of critical histories. This section will look primarily at the early evolutions of Basic Design at the Central School of Art in order to re-evaluate its place in the history of the movement. Key to this will be several documents from the William Johnstone archive at the National Library of Scotland which offer insights into the relationship of Johnstone to other later Basic Design practitioners, as well as the models of Basic Design which were taught at Central from the late 1940s.[91] First I will highlight some of the national documents and policies for higher art education which contributed to the period of pedagogical change in the post-war period.

The immediate post-war years saw British art schools enter a period of rich development and experimentation – as discussed in the introduction, this can in part be attributed to the changes in assessment procedure implemented after the Bray Report of 1948.[92] The Committee on Art Examinations, chaired by Mr F. Bray, had been commissioned in 1947 to:

> '…examine the present system of Arts Examinations for the Award of the Intermediate Certificate in Arts and Crafts and the National Diploma in Design of the Ministry and to consider the possibility of replacing them by a system of internal examinations with external assessment.'[93]

---

[91] National Library of Scotland. *William Johnstone Archive.* Dep. 322

[92] For an extract and analysis, see Ashwin, C. (1975) *Art Education: Documents and Policies (1768-1975)* SRHE. pp. 85-91

[93] *Ibid.* p. 87

The Bray Report recommended that schools of art should be granted more autonomy and as a result, central assessment was replaced by a mix of internal and external assessment. In accordance with the report, the National Advisory Committee on Art Examinations was appointed, and in 1957 they recommended that:

'A number of art schools are, in our view, well able to bear responsibility for planning courses and examining students with a minimum of outside control. We believe that, with greater freedom, these schools would increasingly develop their own characteristics and make a more distinctive contribution to art education.'[94]

This report recommended a gradual winding-up of external assessment, marking a short period of freedom in curriculum design for British art schools, which was only curtailed by the gradual introduction of the Diploma in Art and Design (DipAD) from 1964. It was 1964 when the Summerson Report was published, reporting on the progress towards implementing the changes outlined in the first Coldstream Report of 1960, with the first art schools approved for the DipAD in 1964.[95] The DipAD meant that certain conditions had to be met in order for schools to deliver the course, including adequate facilities and teaching staff to deliver the compulsory academic elements of Complementary Studies and Art History.

These changes will be examined in greater detail in the context of the Hornsey sit-in, but for now it is worth noting that while the Coldstream Report formalised the structure and conditions for the new DipAD, the committee also proposed that 'each art school should be free to construct its own pre-diploma course without reference to any national body'.[96] This was in part prompted by the amount of energy, innovation and

---

[94] *Ibid.* p. 91

[95] NCDAD. "First Report of the National Council for Diplomas in Art and Design" *(The Summerson Report),* 1964 also: NACAE. "First Report of the National Advisory Council on Art Education" (*The First Coldstream Report),* 1960

[96] *Ibid.* p. 96

experimentation that surrounded the 'basic courses' – the experimental summer schools by the Basic Design staff from Leeds and Durham stimulated discussion about a shared 'basic' or foundation education for artists and designers and in this way the Basic Design movement provided the formative models for foundation courses in the UK.

The evolution of Basic Design courses had arisen from the need to reassess the key formal and material elements of higher art education. Basic Design had also provided a vital bridge for students leaving the very conservative secondary school system and entering into art schools where the methods and ideas were so radically different. This was one of the reasons that many of the Basic Design practitioners were also involved in summer schools in the mid-1950s to mid-1960s – it gave practitioners a chance to come up with condensed courses teaching the language of abstraction in an accessible way, an intensive introduction to line, form, colour and structure.

Many of the summer school participants were amateurs or teachers and thus courses were designed to overcome the division between the predominantly representational teaching focus in secondary education and the kind of visual language that was relevant to contemporary abstract practice. A small number of curriculum documents for these early summer schools still exist and were reviewed by Richard Yeomans in his doctoral thesis.[97] They demonstrate clearly the same broken-down grammar of form which Maurice de Sausmarez later articulated fully in his book about Basic Design teaching methods.

[97] Yeomans. *Op. Cit.* (1987)

Tom Hudson came into contact with Victor Pasmore while in an early teaching post at the provincial school of Lowestoft, where he was putting into practise his developing interests in 'child art' theories and Herbert Read. There is little in the way of archival material from this time, but David Thistlewood offered a thorough account of Hudson's early development in an obituary he wrote for the artist following his death in 1997.[98] From 1954, Hudson then participated in the organisation and teaching of the early Basic Design summer schools, alongside Pasmore, Thubron, Ehrenzweig and Frost. These summer schools in North Riding near Scarborough were extraordinary events, bringing together trainee teachers, artists, students and amateurs to explore contemporary visual arts. They came about because of the enlightened leadership of the North Riding Education Authority under John Wood, who was an enthusiastic advocate of the new techniques developing in Leeds.[99] By 1956 Hudson had joined Thubron at Leeds as a member of staff.

As well as summer schools at North Riding, there were other such experiments at the Byam Shaw Summer School in London organised by Thubron - at this summer school, the young Bridget Riley met Anton Ehrenzweig, and began her earliest experiments into optical effects, framed by the Gestalt concerns built into the Basic Design movement.[100] Figure 2 (overleaf) is a photograph of student work at the 1962 summer school at Bishop's Stortford, under Thubron's tutelage. A constructivist assemblage with paint, it illustrates the Basic Design preoccupation with line and structure, as well

[98] Thistlewood, D. (1998) "Obituary. Tom Hudson". *Journal of Art and Design Education.* Vol. 7. Issue 2.
[99] For a very brief account of the summer schools at North Riding, see: Manson, D. (2010) *Willy Tirr (1915-1991) Figures in a Landscape.* Authorhouse. Milton Keynes. p. 31
[100] Beth Williamson mentions this exchange briefly - see: Williamson, B. (2008) *Anton Ehrenzweig: Between Psychoanalysis and Art Practice*. PhD Thesis, University of Essex.

as the more established focus on colour that was apparent within the Leeds strain of Basic 'research'. Thubron made an enthusiastic contribution the summer schools across the years.

Figure 2: Anon: Student of Harry Thubron. (1962) *Construction.* Bishop Stortford Basic Design Summer School. NAEA.

Very little research has been done into these summer schools, although in July 2012 there was an exhibition exploring the Barry Summer School in Wales, bringing together photographs and other memorabilia pertaining to the schools of the 1960s and 1970s.[101] Tom Hudson taught at Barry - Figures 3 and 4, overleaf, show Tom Hudson introducing a session to a rapt audience of students and staff. Behind him is a drawing and mobile evidently based upon the growth pattern of leaves. This manner of analysis

[101] *Barry Summer School: A Retrospective Exhibition.*(July 24 – Sept 8 2012) Art Central (Barry) and locations in the Vale.

of natural form was an integral element of the Basic Design movement, heavily influenced by *On Growth and Form*, by D'Arcy Wentworth Thompson.[102]

Figure 3: Anon. (1965) *Tom Hudson introduces a series of 'Happenings'* at the 1965 Barry Summer School (image credit to Performance Wales research project)

[102] Thompson, D. A. W. (1917) *On Growth and Form.* Cambridge University Press. Cambridge.

Figure 4: Anon. (1965) *Students listening to Tom Hudson*. Barry Summer School. (Image credit to Performance Wales research project)

Such exercises involved a mathematical measuring of distances between leaves on the stem, resulting in images which had the same underlying sense of structure of natural forms as D'Arcy Wentworth Thompson's diagrams. Other artists at Barry included John Epstein, Robin Page and Terry Setch.

At the end of the 1960s, there was a final and dramatic incarnation of the Basic Design summer school, in the epic adventure across Europe by boat and train taken by more than twenty students and staff to Famagusta in Cyprus in 1969 and repeated the following years. This was organised by the Cypriot Stass Paraskos, who trained at Leeds and had a great affinity with the teaching practices of both Hudson and Thubron. When Hudson moved to Leicester College of Art, he gave Paraskos a teaching post there, and Paraskos recalls that it was Hudson who influenced him the most during his own education.[103]

In 1969 the group arrived penniless after their cancelled plane led to a long and expensive journey across the continent, to be kindly received by the Cypriot authorities and provided with a primary school, closed for summer, in which to work and sleep, as well as selected art materials. Paraskos recalls that they slept on the floor on beds they made by gathering dried seaweed, a spirit of adventure which was revived in 1973 when Paraskos was given a derelict site in Lempa, a small village near Paphos, in order to move the suspiciously hip art students away from the tourism development taking place at Famagusta in an age of Communist suspicion in the region.[104] There the participants began building and renovating, creating studios and sleeping spaces, clearing junk and beginning a wall from found objects and new sculpture.
Figure 5, below, shows the wall of sculpture, which has developed at Lempa since the 1960s. The Cyprus School of Art exists to this day as a kind of permanent enactment of the spirit of the summer school - an education without a qualification, a focus on the key formal and expressive qualities of Basic Design, the intuitive mark and the primacy of material to creative development.[105]

[103] Stass Paraskos interviewed by the author. September 2011.
[104] See Cornall, C. in Paraskos, M. (ed) (2010) *Stass Paraskos.* Orage Press. London. p. 35
[105] Stass Paraskos Interviewed by the author. September 2011.

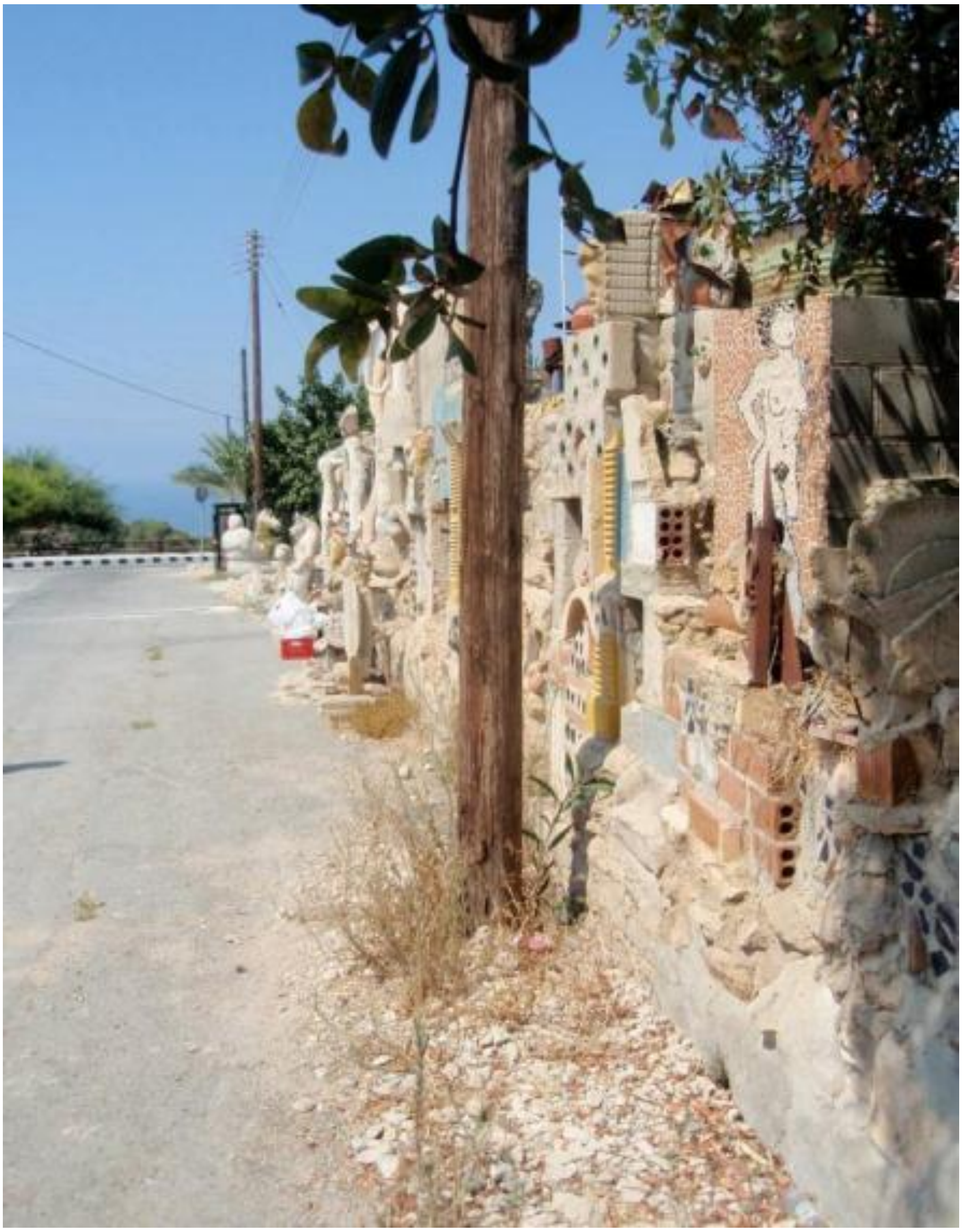


Figure 5: *Boundary Wall, Cyprus College of Art,* Lempa 2011

These early summer courses attempted to condense the principles of Basic Design into a shorter curriculum, creating links between art school staff, practicing artists, amateurs and school teachers. It was a chance to overcome the increasingly large gap between secondary education and the art school which has remained an issue ever since. By the 1960s experimental foundation courses abounded – one such experiment was ‘Groundcourse’ at Ealing, which is the subject of the next case study within this thesis.

These factors contributed to creating a short period of pedagogical freedom for British art schools, particularly around ‘basic’ or foundation years, after the withdrawal of central assessment and before the new strictures of the DipAD. Since so many of the leading figures in the art world such as Hamilton and Pasmore made their living through teaching the school of art was something of a locus for ideologies and concerns in contemporary art, a site for experiment through education. That the issue of art school teaching was considered of high creative and experimental value during the Basic Design years is further proven by the small number of exhibitions which took place about Basic Design’s abstract pedagogy in its own right; most notably *The Developing Process* exhibition at the Institute of Contemporary Arts in 1959. Because basic courses could be devised in-house, they were the natural outlet for experimental approaches. Moreover, they occupied something of a philosophical place in the higher art education structure, representing as they did a kind of ideology of art practice, an introduction to vital ideas and issues of the day for new students.

ii) Herbert Read, the ICA and the Psychology of Basic Design

Herbert Read’s place in the theoretical and critical culture which shaped the Basic Design movement is a contentious subject, given that he was little-recognised by Basic Design practitioners as an influence. David Thistlewood, who curated the second of two ICA Basic Design exhibitions, *A Continuing Process* in 1981, was also author of *Herbert Read: Formlessness and Form,* which offers a thorough account of the aesthetics of Read.[106] Thistlewood, therefore, played an important part in the dissemination of Read's contribution to the ideology of Basic Design. Read's 1943 publication *Education through Art* was the primary sourcebook for art teachers in the late 1940s and throughout the 1950s – although by the time of the Bretton Hall conference, it was evident that the concept of art as pure, ungovernable self-expression was losing favour and had lost its original, anarchical appeal.

Between the individuated languages of artistic autonomy which constituted abstract expressionism and the new demand for Industrial Designers there was a tension which shook the foundations of art education as the role of the artist in contemporary society was becoming increasingly uncertain. The first task for artist-teachers in the 1950s, then, was to advocate and develop the future role of the visual arts in the face of this uncertainty. In 1934, Herbert Read had written *Art and Industry,* an investigation of the place of art in the sophisticated industrial production of the twentieth century. In his introduction he wrote:

'Not until we have reduced the work of art to its essentials, stripped it of all the irrelevancies imposed on it by a particular culture or civilisation, can we see any solution of the problem. The first step, therefore, is to define art; the second is to estimate the capacity of the machine to produce works of art.'[107]

Read argued for a reassessment of aesthetic values that would be relevant to the age of the machine, suggesting that traditional conceptions of ornament were no longer suitable. However, Read had a romantic view of the function of art. Writing in *The Listener* in 1930, he argued:

---

[106] Thistlewood, D. (1984) *Herbert Read: Formlessness and Form: An Introduction to his Aesthetics.* Routledge. London.
[107] Read, H. (1934) *Art and Industry.* Faber and Faber. London. p. 7

‘Let the machines multiply in number and efficiency: they make the world a nicer place to live in. And let the artists keep to their only legitimate business, which is the statement of truth in terms of beauty.’[108]

This was written in the period Read worked on *Art and Industry*, between 1929 and 1934. It was to prove an enduring text on the subject, despite the focus, throughout, on aesthetic values in modernism. In his chapter about art and industry in education, Read proposed that technical education see artists instructed in specialist technical schools, or even in factories, and he referenced the Bauhaus.[109] While Read argued for abstract art having a role to play in Industrial Design, the argument was somewhat amorphous - it appears that Read offers this as a solution to the outmoded forms of ornament in design, with their roots in what he calls ‘handicrafts’. At the same time, Read calls for a clearer understanding of ‘the nature of art’.[110] It was becoming apparent that the challenges of a new age had yet to be fully understood, particularly how to integrate abstraction into the evolving art curriculum, while still keeping pace with technology.

It was a decade after Read published *Art and Industry* that he was part of another of the fundamental developments for the Basic Design movement: this was the foundation of the Institute of Contemporary Arts in London. In Edinburgh in 1932, Read had tried to get his idea for a Bauhaus-inspired art school off the ground, having good links with the Bauhaus pedagogues.[111] He visualised this as an experimental laboratory; a modern place housed in a functional building, to include studios and

---

[108] Read, H. (1930) “The Meaning of Art”. *The Listener.* 29 January 1930. p. 192

[109] Read. *Op Cit*. (1934) p. 131
[110] *Ibid.* p. 7
[111] Goodway, D. (1998) *Herbert Read Reassessed.* Liverpool University Press. Liverpool. p. 228. Goodway references documentation in the Herbert Read archive, 37/55, University of Columbia

lecture rooms, music rooms and film studios. He even found financial backing for this proposed venture.[112]

However, it never happened, with little documentary evidence of local support, and after World War II interrupted his plans with Peggy Guggenheim for a new London contemporary art organisation, he found success as part of the committee that saw the plans for the Institute of Contemporary Arts through to fruition. This event is well-documented by David Thistlewood in *Formlessness and Form,* and I mention it here for the significance of the ICA's founding values: a site of exchange, bringing together not only different art forms but, vitally, arts and sciences.

As explored within this study, the ICA had direct connections with the system theory developments which were contemporary to it. Lawrence Alloway and Eduardo Paolozzi had an interest in the early cybernetic writing of Norbert Wiener, demonstrating a systems awareness at the heart of the Independent Group.[113] Read too had a strong interest in interdisciplinarity, and he very much admired the new and widespread synthesis between the sciences which was formalised within von Bertalanffy’s creation of GST. The conception of an ‘art laboratory’ has important implications for the ideology of art – for a start, it indicates a level of intellectual control, of conscious experimentation, which is a clear indication of changing values. The ICA provided a new forum for the artists of the day to consider the future of the

[112] Thistlewood. *Op Cit.* (1984) pp. 16-17
[113] Stryker, E. M., (2011) “Parallel Systems: Lawrence Alloway and Eduardo Paolozzi”. *Tate Papers.* Issue 16. 1 October 2011

discipline and it formalised the rhetorical and interrogative values of a new generation of post-war artists.

iii) William Johnstone, Art and Post-War Industry at Central

The Central School of Arts and Crafts was founded in 1854.[114] It had a unique focus on arts and industry - Johnstone, during his tenure as principal of the Central School from 1947 to 1960, went as far as to write that Central was:

'…the first school in the world to grasp the relationship between the designer and the machine.'[115]

He also wrote:

'The idea behind the founding of the school spread to Germany and indirectly to the Bauhaus. Hitler drove Gropius and his friends to the States, where they have made a deep impression on current American art teaching. The Central School has had a notable influence on the Continent and throughout the world.'[116]

While the latter comment was a somewhat ambitious claim, Johnstone still makes an important point – the reconciliation of art and design in the industrial age was an issue confronted in schools of art across Europe from the middle of the nineteenth century. In Great Britain there was a long history of interest in the place of art schools in industry, particularly the economic benefits that could arise from this. In 1836 the *Report of the Select Committee on Arts and Manufactures,* chaired by William Ewart, was published. It outlined the attitude to design upon which many art schools, including Central, were founded:

---

[114] Central St Martins since its 1989 merger with St Martins College, and also now part of the University of the Arts, London.
[115] Johnstone, W. *Typescript about the Central School,* William Johnstone archive, National Libraries of Scotland Dep. 322
[116] *Ibid.* pages in fragments, loose leaf and not numbered

‘Unless the Arts and manufactures be practically combined, the unsuccessful aspirants after the higher branches of the Arts will be infinitely multiplied, and the deficiency of manufacturing-artists will not be supplied.'[117]

This report looked at the possibilities that training artists would create, and suggested that art schools would supply industry with artists who hadn’t attained the genius necessary for the ‘higher arts’, but whose skills would be sufficient to provide design services to industry. The art schools were, therefore, the source of Industrial Designers; providing for the higher aims supplied the lower goals. Therefore, while in the UK the necessity of training artists in order to supply industry had long been acknowledged, design was considered a secondary outcome of fine art training. However, over the course of the nineteenth century the status of arts and crafts improved. Some of the art schools in the UK were founded to meet the new demands on artists of the industrial age: this included the Central School of Arts and Crafts.

For William Johnstone, the key issue for art students in the post-war environment was how they might adapt in an age of technology and engineering on a huge scale. He believed the most awe-inspiring creations of the day came from these disciplines and not necessarily from the visual arts and design. In order to maintain relevance despite the technological sophistication of the age, Johnstone believed that artists and designers had to be equipped with a modern kind of language which might be applied in varied and complex environments. Johnstone took up his post as Principal of the Central School of Arts and Crafts in 1947. It had been twenty years since the closure of the Bauhaus when London schools of Art began to explore, in a serious way, the

[117] Ewart, W. (chair) (1836) "Report of the Select Committee on Arts and Manufactures". See Ashwin, C. (1975) *Art Education: Documents and Policies.* SRHE. London.

concept of a ‘basic course’ similar to the Bauhaus *Vorkurs,* but the concerns that drove Basic Design in the UK were far removed from those upon which the Bauhaus was founded. Beth Williamson noted in her PhD thesis that:

‘The Basic Design course that Johnstone sought to establish at the Central School in 1947 had been first formally introduced in Britain by artist-teachers Jesse Collins and Albert Halliwell in the 1930s.’[118]

The little-known designer-teachers Collins and Halliwell had delivered a number of workshops in the *Vorkurs* tradition at Camberwell School of Art where Johnstone had worked previously, mainly delivered to design students but created in the spirit of ‘basic form’. The teaching methods for these early courses were certainly inspired by the Bauhaus – as noted Halliwell and Collins both evolved their *Vorkurs* techniques at Camberwell, openly exploring Bauhaus concepts. However, Johnstone’s motivations in employing Halliwell and Collins related to his own interest in improving the troublesome relationship between art and industry, upon which the Central School of Arts and Craft was founded.[119]

The Bauhaus had offered one model for an art school in the machine age, but as technologies evolved so the issue did for art schools. The technological advances made in the first half of the twentieth century were substantial, particularly those of World War II. Several provincial art schools were founded with this aim of supplying artists for industry, and the drive for specialised teaching was further spurred on by the Arts and Crafts movement. William Richard Lethaby was the key figure in the foundation

[118] Williamson, Beth. (2008) *Anton Ehrenzweig:Between Psychoanalysis and Art Practice*. PhD Thesis, University of Essex. P. 170.
[119] Founded in 1896 to provide art training to the craft industries, the school was a product of the arts and crafts movement as well as of the growing national interest in the place of artists in industry.

of the Central School, using his position as Art Inspector for the Technical Education Board of London County Council to see the project through.[120]

As the school's first principal, he worked towards breaking down the barriers between the fine arts and design – twenty years before the Bauhaus. This heritage of arts and industry at Central was still evident when Johnstone took up his post in 1947. Basic Design might have had strong Bauhaus parallels, but at Central, it was more broadly a product of the art/design debate around industry. Johnstone's focus upon the evolving relationship between art and industry must also be read in a post-war context, given that during and after World War II the UK had seen significant developments in mechanical engineering, as he recalled:

'Art was beginning to find its lost reality, to become again a necessity of living, an extension of being, until we find that today science and engineering have created new art forms on a majestic scale. A new art that really belongs to life has grown without our even noticing that it has happened, in the design for solar heating, for radar, for nuclear experiments, for extracting energy from the sea.'[121]

The engineering innovations listed by Johnstone were not art in any conventional sense of course. Perhaps what he was grasping at was the power of the vast and complex engineering feats of the mid-century to move and inspire us and their ever-growing presence in the cultural landscape after the innovations of World War II. Johnstone's strain of Basic Design was therefore developed in the hope of connecting visual arts with design in a technologically-driven age, and his mention of radar and nuclear technologies place this meditation upon technology firmly in a post-war context.

[120] Swenarton, M. (1987) "The Role of History in Architectural Education". *Architectural History.* Vol. 30. 1987. pp. 201-215. p. 202
[121] Johnstone, W. (1980) *Points in Time.* Barrie and Jenkins. London. pp. 216-17

Jesse Collins is better known in the context of the history of design, because he put together the first fully-fledged graphic design course at Central, the term 'graphic design' having only recently come into circulation when it was coined by Richard Guyatt, head of Publicity Design at the RCA.[122] This was after a slightly supercilious article in *The Times* which applauded the innovations of the RCA's Principal Robin Darwin but criticised the term 'Publicity Design' as vulgar, due to its association with commercial arts, a discipline widely judged at the time to be staffed by fine artists who had failed to make the grade.[123] At the RCA, a similar interest in developing the design disciplines and forging closer links with industry developed in the post-war years. Alex Seago writes that 'Until about 1955 the RCA lagged well behind the Central in terms of innovation...'[124]

This was in light of Johnstone's inspired hiring, as well as the revival of the design subjects for a new era. Graphic Design at Central was regarded as the best in the UK and graduates in the period included Terence Conran, Ken Garland, Derek Birdsall, Alan Fletcher, Colin Forbes, Peter Wildbur and Philip Thompson.[125] Johnstone himself believe that the strongest students were attached to design disciplines during this era, rather than the fine arts, recalling that:

'During the fifties the very best students chose to study graphic design and typography rather than opt for Fine Arts, which seemed only to attract third- or fourth-rate students.'[126]

---

[122] Seago, A. (1995) *Burning the Box of Beautiful Things: The Development of a Postmodern Sensibility.* Oxford University Press. Oxford. p. 26
[123] *Ibid.* p. 26
[124] *Ibid.* p. 93
[125] Odling-Smee, A. (2001) "Interview with Ken Garland". *Eye Magazine.*Issue 66. Viewed May 2012. http://www.eyemagazine.com/feature.php?id=152&fid=653
[126] Johnstone, W. (1980) *Points in Time.* Barrie and Jenkins. London. p. 226

Johnstone's autobiography highlighted the innovations in Industrial Design at Central after the war, here going as far as to suggest that true talent gravitated towards these disciplines. He believed that his educators had learned from the Bauhaus and used the techniques to reinvigorate design practices for the post-war city and that the Central School of Art was the hub from which other strands of Basic Design developed. Amongst Johnstone's staff at Central were Victor Pasmore, Richard Hamilton, Eduardo Paolozzi and Anton Ehrenzweig, all of whom had an important part to play in the future of the Basic Design movement.

Johnstone was keen after his retirement, to emphasise the Basic Design developments made at Central, especially the industrial roots, as will become clear below. It was certainly true that his place in the growth of the Basic Design movement in Britain has been overshadowed by his more famous successors, most of who had worked for him early in their careers. As noted these included Victor Pasmore, Richard Hamilton, Eduardo Paolozzi, Alan Davie and Anton Ehrenzweig. With the latter gaining fame for his work on art and psychology while training art teachers at Goldsmiths and the former four gaining international reputations as visual artists and educators, Johnstone's own reputation as a painter and educator has suffered by comparison. This was evidenced by a recent article in *Frieze Magazine*, written by Martin Le Grice and published in October 2011. It consisted of a brief a history of the Central School but it neglected to mention Johnstone at all.[127] For the period of the 1950s and 1960s, it offered instead an overview of Basic Design in King's College and Leeds, again focusing on his more famous employee, Victor Pasmore.

[127] Le Grice, M. "History Lessons". *Frieze Magazine.* October 2011. Issue 142. Accessed online 10/10/2011: http://www.frieze.com/issue/article/history-lessons/

iv) The Loss of Basic Design's Origins

This section contains several hitherto unpublished letters and documents from the National Library of Scotland.[128] The extraordinary exclusion of Johnstone's thirteen years as principal might be better understood in the context of the received history of Basic Design, particularly the proactive approach towards promotion and engagement taken by Victor Pasmore during and after his time at King's College. Pasmore's famously vocal contribution to the Coldstream committee meant that several of the Basic Design exercises became nationalised approaches via the newly developed DipAD.[129] During the period in which the Coldstream committee met, Pasmore was working on the 1959 Basic Design exhibition *The Developing Process*, which was shown at the Institute of Contemporary Arts in London and the Hatton Gallery in Newcastle.

Its name came from Pasmore's and Hamilton's newly conceived foundation studies at King's College, University of Durham. The teaching models put forward for the DipAD by Pasmore and his contemporaries did not last the decade; they were abandoned as too restrictive in the rapidly changing visual culture of the late 1960s. However, the publicity generated by Pasmore around the exhibition *The Developing Process* and through the Coldstream Report placed Basic Design firmly in the North, rather than London. Johnstone was invited to take part in a discussion about this

[128] William Johnstone Archive. National Library of Scotland. Dep. 332.
[129] William Coldstream himself commented on this when interviewed by Linda Morris in 1985: 'It should have been called the Pasmore Report, then people would have understood what was happening…' Accessed at www.thehornseyproject.omweb.org/Modules/Wacca/LindaMorrisPaper Accessed June 2010

exhibition but declined.[130] Pasmore edited a publication by the same name to correspond with the exhibition. The prominence of the ICA in publicising and disseminating current issues in contemporary art resulted in Basic Design being associated more with Durham and Leeds than with Camberwell and Central.

Between May 17 and June 4 1981, the Institute of Contemporary Arts held a second 'Basic Design' exhibition entitled: *A Continuing Process: The New Creativity in British Art Education 1955-65*. The catalogue was written by David Thistlewood, whose doctoral research had examined the relationship of the writings of Herbert Read on child art to the Basic Design movement. The exhibition itself was organised by Pasmore, with Thubron, Hamilton and Hudson, and it was the first concentrated attempt to outline, retrospectively, the various permutations of the Basic Design movement. Johnstone was not involved and he was given only a minor mention for having brought together the artists who were the focus of the exhibition.

Johnstone's own feelings on the matter were clearly articulated in a letter he sent in response to a review of the *A Continuing Process* exhibition in *Art News and Review* on the 25th of April 1981. He wrote:

'Neither Eduardo Paolozzi, Richard Hamilton nor Robert Adams ever taught Basic Design courses at any time at the Central. Victor Pasmore taught Still Life Painting. Although little confusion might be caused among your readers, it should be pointed out that the illustrations accompanying the articles would seem to relate to the earlier Bauhaus formulations of Basic Design education, they have a quaint old-fashioned look and I should hate to think that there should be any assumed connection between them and the work of the Central School!'[131]

[130] Letter from Lawrence Alloway to William Johnstone. 03/04/1959. William Johnstone Archive. National Library of Scotland Inv. Ref: ACC 8183/2
[131] Johnstone, W. *Letter to Art News and Review.* May 1981. NLS Johnstone Archive Dep. 322

Johnstone evidently wished to clarify that the individuals who assembled the exhibition were not to his mind Basic Design teachers at Central which he viewed solely as the defined courses led by the Industrial Design department at Central. However, the comment was also extremely dismissive of the permutations of Basic Design on display in the exhibition. In the same letter he outlines some of the staff he considers to have innovated in the creation of London Basic Courses from the 1940s.[132] Pasmore wrote a terse response to *Art News and Review* regarding Johnstone's letter:

'Sir, acknowledgements to the Central School of Arts and Crafts in relation to the current exhibition at the I.C.A….were made out of courtesy. I am sorry, therefore, if the information supplied by me to your reviewer, Miss Reichardt, was incomplete and the dating incorrect. I do not think, however, that this justifies a denial, by the principal of the Central School, of the basic teaching done there during the years around 1949/53 by Adams, Hamilton, Paolozzi and myself. If Mr Johnstone believes what he says then I can only conclude that the principal of the Central School did not know what was going on in his departments.'[133]

The evident tension between the two men comes through at several instances in Johnstone's autobiography, *Points in Time.* It should be noted that the book was published in 1980, a year prior to the ICA exhibition. In a letter Johnstone received the following year, a friend commented that:

'The newspaper articles referring to Art Education are of course no more than bait. The subject…only became newsworthy on publication of your autobiography.'[134]

The writer goes on to comment upon Pasmore's influence on the Coldstream Report, before comparing the character and style of Pasmore and Halliwell – each figure evidently representing one of the two alternative versions of Basic Design's history offered by Pasmore and Johnstone. For Pasmore, innovations in Basic Design

[132] These included Jesse Collins, Albert Halliwell, Norman Dawson and himself. The former names had all devised and taught Basic Design through various routes, including typography and jewellery, at Central.
[133] Pasmore, V. *Letter to Art News and Review.* May 1981. NLS Johnstone Archive Dep. 322
[134] Letter to William Johnstone, signed 'Jack'. 13/04/81. William Johnstone archive, National Library of Scotland. Acc. 8183

originated in Durham under his own leadership, as well as in Leeds. In *Points in Time,* Johnstone offers his own account of Basic Design's roots in Industrial Design, as well as dedicating plenty of time to describing Pasmore's difficulty in understanding, let alone mastering, abstract art. He wrote that:

'Victor was puzzled by Edwin's interest in design and its application in commercial usage, and he came often to see the work being done by the students. In 1947 Victor produced his first abstracts, very similar to our first steps in Basic Design'.[135]

Johnstone's evident wish to belittle Pasmore's reputation as an abstract painter comes up in the book several times and the Johnstone archive at the National Library of Scotland also contains an unsent letter by Johnstone, handwritten, in response to an article about Charles Biederman which had mentioned Pasmore's conversion to abstraction in glowing terms. Johnstone wrote of the difficulties that Pasmore had in grasping art after postimpressionism, including cubism and surrealism. He also described Pasmore's visits to Halliwell's Basic Design classes, from which, Johnstone claimed, Pasmore "borrowed" several ideas and also stating that it was Pasmore who asked Johnstone if he might follow him from Camberwell to Central after Johnstone took up post there. Johnstone's closing remarks in this unsent letter were cutting in the extreme, describing Pasmore's difficulties:

'Pasmore co-opted William Miller again, assuaged further assistance from the Furniture Department and made his tasteful constructions. Unfortunately the students at the Central School were used to a more professional approach towards problems in art than Pasmore's amateurism could provide; because of lack of attendance his classes were closed.'[136]

Johnstone has originally written tasteful 'derivations', which he scored through and replaced with 'tasteful constructions'. The message is clear: he considered Pasmore a

[135] Johnstone, W. (1980) *Points in Time.* Barney and John. London. p. 205
[136] Johnstone, W. (1969) *Unsent letter.* Johnstone archive, National Library of Scotland. Dep. 322

second-rate abstract artist who, despite his famous conversion to abstraction, had difficulties understanding and engaging with twentieth century painting. Herbert Read notably described Pasmore's conversion as 'the most revolutionary event in post-war British Art'; a claim that then appeared in a number of reviews and articles.[137] Johnstone's unsent letter was evidently an attempt to combat this perception of Victor Pasmore, which he - perhaps wisely - did not send.

A Continuing Process, then, forged a contextual framework for Basic Design that focused on the two poles of King's College and Leeds, underpinned by Thistlewood's focus on Herbert Read:

'The principal innovators here were four – Victor Pasmore, Richard Hamilton, Tom Hudson and Harry Thubron.'[138]

Johnstone's place in this was presented by Thistlewood as that of fostering or encouraging the key figures, summed up in a single sentence within the catalogue:

'There was a whole range of alternatives encouraged by William Johnstone when, as Principal of the Central School of Art, he brought Victor Pasmore, Richard Hamilton, Eduardo Paolozzi, Robert Adams, William Turnbull, Alan Davie and others into his studios, giving them free rein to impart creative attitudes in previously moribund departments of design.'[139]

The place of both Johnstone and Central has thus been reduced to a minor mention in the Basic Design story, when in truth the teaching at Central had a formative influence on the young artist-teachers of Basic Design. I hope to address this imbalance here, because the issues of industry, science and technology confronted at the Central provoked not only the development of curriculum models which included shared

[137] Read, H. (1964) *A Concise History of Modern Sculpture.* Thames and Hudson, London.
[138] Thistlewood, D. (1981) *A Continuing Process.* Institute of Contemporary Arts (London) p. 6
[139] *Ibid.* p. 6

foundation courses, but also, and vitally, the language of abstraction which the fine art students at Leeds and Durham were taught.

v) Johnstone's Organisational Systems and the Growth of Basic Design

One of the outcomes of Johnstone's focus on basic form and Industrial Design was a greater unity between the various courses and classes on offer and more sharing between them. In his biography *Points in Time*, Johnstone wrote that:

'…I wanted to synthesise the different schools into a far more integrated unity. I intended also to introduce what were then called 'basic design' courses throughout the School which would be geared to give a grammar of art in such a way that each student could develop any particular medium he or she happened to choose. Then all students, with certain variations in training, could adapt themselves to work in any media.'[140]

When Johnstone became Principal, the Central School had six schools within it: drawing, painting, modeling, etching and allied subjects, book production and graphic design, interior design and furniture, textiles design, theatrical design, and silversmithing and allied crafts.[141] Five of the six schools, therefore, were directly related to craft and industry. Johnstone wanted to forge better connections between subject areas and created an Industrial Design school developed from a course which had, since the war, run under the title 'Design for Light Industries and Plastics'.[142] Jesse Collins was recruited by Johnstone to teach this subject, and then Albert Halliwell was recruited to head it as a newly formed department of Industrial Design.[143]

---

[140] Johnstone, W. (1980) *Points in Time.* Barrie and Jenkins. London. p. 220.
[141] Central School of Arts and Crafts archive overview: accessed 12/11/11 at: http://www.aim25.ac.uk/cats/56/6247.htm
[142] Johnstone, W. (1981) *Letter to Art News and Review*. William Johnstone Archive, National Libraries of Scotland. Ref ACC. 8183/2
[143] *Ibid.*

In the interwar period, there was a focus on employee satisfaction and social relations, in keeping with the broad cultural shift towards individual psychological welfare and development.[144] The influential Hawthorne factory experiments demonstrated, for the first time, the extent to which scrutiny and interest altered staff performance.[145] After World War II, however, the landscape changed for organisational management. This change is often attributed to the invention of complex logistics during the war and the period also saw the explosion of systems theories, most significantly Ludwig von Bertalanffy's General System Theory (GST).[146] Von Bertalanffy's background was in biology and he sought to establish universal principles which could be applied to all systems. His work was broadly influential in the sciences, in organisational development and in social studies. He writes:

'The 19th and first half of the 20th century conceived of the *world as chaos*…Now we are looking for another basic outlook on the world: *the world as organisation.'*[147]

Von Bertalanffy goes on to describe the prolificacy of new disciplines centred on organisational theory, such as system theory, cybernetics, information theory, games theory and operations research – a real explosion of systems thinking. Developments in systems theories can be equated to the increasingly mechanised world, and this was the backdrop to Johnstone's push towards synthesis at Central.

---

[144] The Hawthorne Report was widely influential at the time, based on a series of experiments on workers in a factory called the Hawthorne Works, which proved that workers' behaviour modified when an interest was taken in them. See Gillespie, R. (1991) *Manufacturing Knowledge: A History of the Hawthorne Experiments.* Cambridge University Press. Cambridge.
[145] *Ibid.*
[146] Von Bertalanffy, L. (1969) *General System Theory: Foundation, Development, Applications.* George Braziller. New York.
[147] *Ibid.* pp. 187-188

Johnstone’s commitment to the vital interaction between industry, art and design led to him placing members of staff outside of their specialist areas. This decision not only forced a kind of interdisciplinary practice upon his staff, but it also led to interactions and outcomes which would not otherwise have taken place. It is clear that the place of Central in the development of Basic Design has been neglected in light of the better-publicised later Basic Design pedagogies at the twin poles of King’s College, University of Durham and Leeds College of Art. This approach to staffing demonstrated a wider view of the art school as a creative mechanism as well as the potential for growth in forging connections between disciplines, departments, individuals and practices.

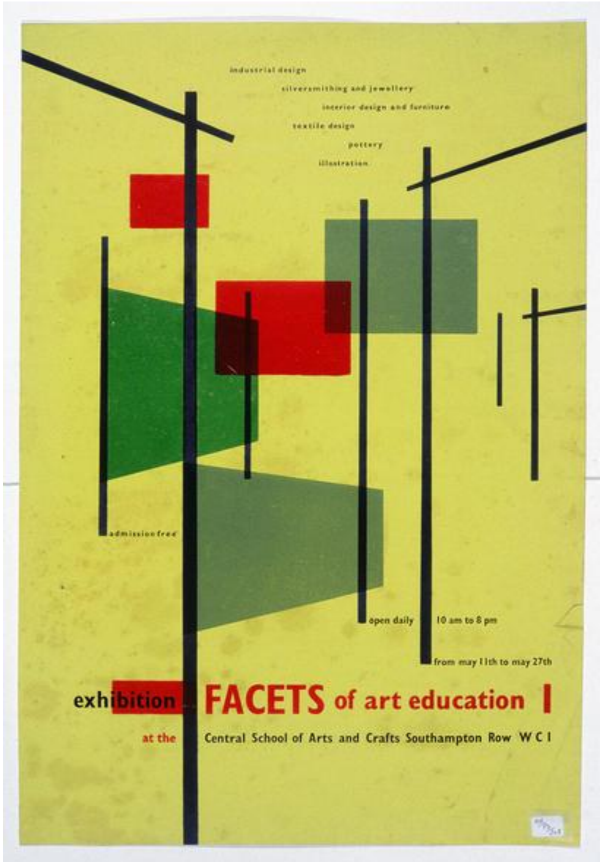


Figure 6: E. Halliwell. Undated. *Exhibition Poster: Facets of Art* Education. National Arts Education Archive (NAEA)

Figure 6, above, shows a poster design by Halliwell which has been dated by the National Arts Education Archive to 1930 - however, it is clearly from much later in Halliwell's career. Halliwell did not start teaching at Central until after Johnstone's recruitment as principal and this poster also shows 'Industrial Design' as a separate department, which did not happen until the late 1940s. In addition, the style of the work, with the crisp geometric forms and sharp colour play, would make around 1960 a more likely date. It was the exhibition poster for *Facets of Art Education* and it listed Industrial Design, Silversmithing and Jewellery, Interior Design and Furniture, Textile Design, Pottery and Illustration as disciplines - all of which are areas of design, not art, despite the title. This shows both the holistic view of art/design which had developed and a better status for the design subjects than that of the interwar years.

The Basic Courses at Central were intended to provide a grammar of art which applied across the boundaries of art and design practice and production: meaningful form and useful function. This cohesiveness would mean, in Johnstone's view, that '…all students, with certain variations in training, could adapt themselves to work in other media.'[148] It was not only the staff that had to be adaptable within Johnstone's Central School system – but also the students. He genuinely believed that a basic training could liberate artists and designers and create endless possibilities. Given that British art education had operated around the idea of specialised disciplines since the earliest academies of art, what happened at Central demonstrated a true change of values. This was from training artists for individualised practice based on a specific skill set to

[148] Johnstone, W. (1980) *Points in Time.* Barrie and Jenkins. London. p.220

training adaptable artist-designers who could move between disciplines and influence their development in an ever-changing industrial world.

The issue of departmental divisions and the decline of discipline-led practice would dominate art schools for the next twenty years, and Basic Design played a large part in this. Initially the movement was egalitarian in persuasion, but when it had been formalised via the first Coldstream report, it became restrictive. This was despite the intentions of its practitioners to build a curriculum of possibility, where the outcomes lay in the hands of the students. The problem, it appeared, was that after the Basic Course (and later, after the 'foundation' course), students had to specialise in a particular discipline within the DipAD structure. In addition, the exercises used by Basic Design teachers lost their experimental flavour with time. The reaction against subject specialisms culminated in Goldsmiths' decision, under Jon Thompson, to dissolve discipline boundaries in the fine arts.[149]

It is important to record that the work Johnstone did to achieve better cohesion between departments, disciplines and practitioners was unusual for its time, and highlights a problem which, a decade later, would become a national issue due to the restrictive nature of the DipAD courses.[150] It is well-documented that Johnstone had an unusual approach to recruitment, often placing teaching staff in subjects outside of their own practice – for example, Paolozzi was placed as a tutor in Textile Design. Paolozzi

[149] Goldsmith's Fine Art department merged painting, sculpture and printmaking in 1974.
[150] A key issue for staff and students involved in the Hornsey sit-in was the lack of fluidity between subjects and skills.

himself recalls that in this early period of hard work and financial struggle, he made the most of the facilities available to him:

‘I was even trying to make money by doing things on order, like curtains, because I had the materials and the technology to do it, and as far as I remember a lot of the sculpture was just done downstairs in ceramics, small modest works.’[151]

This is an interesting outcome of the placement of artists in areas outside their specialisms and it did create pressure upon their own practice. Paolozzi mentioned that it took great focus to retain your own practice:

I mean in a roundabout way if I had been screen-printing and working till 6 at the Central, to go downstairs and work until 10 o'clock, one must have been driven.’[152]

While Johnstone himself would not have viewed this as Basic Design teaching, this approach encouraged the development of shared language across subjects, which is the same principle. In Johnstone’s desire to synthesise the departments of the Central School of Art and Craft we can see his mechanical understanding of the institution, each department interconnected, communication essential to the survival and development of the whole. This conception of an organisation is familiar today – but less so in Johnstone’s day.

However according to Paolozzi, Johnstone was aware of the difficulties this created for artists. After a period away, Paolozzi answered a letter from Johnstone offering him more teaching after a year’s delay. Johnstone responded that he would ‘punish’ Paolozzi by placing him back in the textiles department. Paolozzi was offered a position teaching sculpture at St. Martins and thus declined this offer.[153] Despite the

---

[151] Whitford, F. (1994) *Interview with Eduardo Paolozzi.* Artists’ Lives Project. The British Library. Transcript viewed June 2012: http://sounds.bl.uk/related-content/TRANSCRIPTS/021T-C0466X0017XX-ZZZZA0.pdf

[152] *Ibid.* p. 110

[153] *Ibid.* p. 118

difficulties Johnstone created for his young staff, he also created possibilities. Aside from the difficulties of creating a language of art which could serve both culture and industry, the collisions between disciplines Johnstone produced was a key principle of the Basic Design movement.

vi) A Mechanised Psychology of Art and Basic Design

A measure of the changing attitudes to the success of Basic Design between its 1950s beginnings and mid-1960s demise can be found in the writings of Anton Ehrenzweig, who was involved in the Basic Design movement from its early development at Central School of Art where he worked for William Johnstone in the post of technical assistant in charge of dyes.[154] While there, he worked closely with Paolozzi during his time as a tutor in textiles and while there is little evidence of a friendship between the two men, there was certainly some creative and philosophical discussion. Ehrenzweig used Paolozzi's work as examples in his later writings. Beth Williamson offers a thorough account of Ehrenzweig's career in her PhD thesis, exploring Ehrenzweig's uneasy relationship with the Basic Design movement therein.[155] However, there is one early unpublished essay by Ehrenzweig which is a good measure of how his opinion of Basic Design changed over the years of the movement.[156]

While by the 1960s Ehrenzweig was critical of Basic Design, during his time at Central he appears to have been more receptive to its potential. In the William Johnstone

[154] Williamson. *Op Cit.*, (2009)
[155] Williamson, B. (2008) *Anton Ehrenzweig: Between Psychoanalysis and Art Practice*. PhD Thesis, University of Essex.
[156] Ehrenzweig, A. *Psychological Factors in Teaching Basic Design.* Unpublished draft typescript. William Johnstone Archive, National Library of Scotland Dep. 332/6.

archive at the National Library of Scotland there is a short typescript by Ehrenzweig which offers a positive interpretation of Basic Design. It is a draft book chapter or introduction, and it was written in the late 1950s at the earliest. It could have been intended for a book about William Johnstone published by the Central School in 1959, to which Ehrenzweig contributed.[157] However, by the 1960s Ehrenzweig's writings present indifferent and occasionally critical views of Basic Design. In this early essay, Ehrenzweig explored a number of Basic Design techniques and their benefit for student development, before outlining two distinct methods within them:

'I am contrasting the <u>disruptive</u> method aimed at loosening conscious control with another <u>constructive</u> kind of basic design teaching that strengthened conscious control and "good" taste. These opposing trends have become associated with two artistic movements described by William Johnstone in his introduction; the classical Bauhaus tradition would aim at clean, aesthetic construction, while today's disruptive "accidental" techniques appear associated with contemporary tachism or action painting.'[158]

Ehrenzweig viewed exercises rooted in formal practices of abstraction as forms of behaviour – linked to specific psychological outcomes for the students. He claimed here that *Disruptive* Basic Design exercises were orchestrated by tutors to undermine processes and create surprises. *Constructive* exercises worked towards a constructivist Bauhaus ethic. If this essay was a contribution towards a possible book about the Central School, then it would have been necessary to present a positive point of view about Basic Design, which could explain the contrast with Ehrenzweig's later opinions on the subject. *The Hidden Order of Art,* which was published posthumously in 1967, explores the rich territory of abstract art and psychology. On Basic Design, Ehrenzweig writes:

---

[157] Johnstone, W. (1959) *William Johnstone.* Central School of Arts and Crafts. London.
[158] *Ibid.*

‘When Basic Design was first introduced in the days of the *Bauhaus* and the renaissance of the *Bauhaus* tradition during the nineteen-fifties it did not arrive as the desiccated analysis of empty form which it largely is today.’[159]

It is clear that like most of the individuals associated with Basic Design, by the middle of the 1960s Ehrenzweig had acknowledged the limitations of the movement. However, it is also important to note that his rough, unpublished typescript from the late 1950s demonstrates not only a recognition of the potential of Basic Design, but also its practice at Central under Johnstone.

Ehrenzweig’s contribution to the psychology of art training of the period was extensive, particularly *The Hidden Order of Art,* which brought together psychoanalysis, creative learning and teaching after abstraction – with the decisive note that abstraction was over. Ehrenzweig’s agenda appears to be to re-establish intentionality and intellectual control over the work of art, escaping the formal limitations of abstraction, which he compares to the end of academic realism.[160] Williamson explored Ehrenzweig’s relationship with Freud, as well as notable British psychoanalysts, in some detail within her PhD thesis. For the purposes of this study, it is not the psychoanalytical content of *The Hidden Order of Art* that is its principle point of interest – it is the focus on collective values and experiences in the book. He discussed teaching practices in classes, collective reactions to abstraction, common reactions to certain teaching methods and classes with the book.

---

[159] Ehrenzweig, A. (1967) *The Hidden Order of Art: A Study in the Psychology of Artistic Imagination.* Weidenfeld and Nicolson. London. p. 57
[160] *Ibid.* p. 146

Unlike the psychology of art of the 1940s and 1950s, the individual development of creative potential is not Ehrenzweig's central concern – it is how to manage the *collective* experiences of art education after abstraction. This change is a significant one: it is part of the transition from a psychology of art which focuses on individuals, to one which focuses on the collectivities of art classes, audiences, practices. This new underlying structure is somewhat lost in the text, which is so heavily shaped by Freudian symbolism, but it is there, nonetheless – a change of focus from individual to collective development. As the central aim of this study is to track systematic and mechanistic approaches to pedagogical development, this is a significant transition. Ehrenzweig's changing attitude to Basic Design is a good measure of the peak and demise of the movement.

Ehrenzweig was one of many voices in what was a vibrant culture of enquiry for arts education. The idea of art education as something with rewards beyond its own continuation and worth emerged in the interwar period; using art as a method of maintaining psychological welfare was revolutionary for art teaching at all levels and for all ages.[161] The prominence of the psychology of art in practice and teaching is the 1940s and 1950s was underpinned by the broader importance of psychoanalysis to modernism in art which in itself offered a kind of grammar of form, the work of art operating as a symbolic representation of the psyche.

[161] The rapid dissemination of Steiner's work, Bauhaus emotional-intuitive approaches, and the resulting critical texts such as Herbert Read's *Education Through Art* were all part of the arts education culture of the interwar years.

However, by the mid-1950s the landscape was changing. In 1956 there was a conference at Bretton Hall organised by a Society for Education through Art (SEA), entitled *Adolescent Expression in Art and Craft* - note the focus on expression, which demonstrated the new 20th century values of 'using' art towards personal/emotional welfare. Amongst the attendees were Tom Hudson, Harry Thubron, Maurice de Sausmarez and Herbert Read.[162] Richard Yeomans, in his essay ‘Basic Design and the Pedagogy of Richard Hamilton’, reviewed some of the exchanges, drawn from the conference report by Barclay Russell. He described a clash of opinions:

'Intuition and expression, which had formed the bedrock of much liberal art educational thinking, was brought into question and found wanting...The roles of the traditional crafts were equally scrutinised and their relevance and compatibility to the world of science and technology examined.'[163]

This tension between intuitive expression and technology was the backdrop to the emerging Basic Design movement. Yeomans outlined the two strands of this emerging problem as the place of Industrial Design in art schools and the increasing interest in the psychology of art, as typified by the writings of Herbert Read and later, Anton Ehrenzweig.[164] He also discussed the conflicting viewpoints presented at the conference, in his 1988 paper ‘Basic Design and Richard Hamilton’s Teaching’, noting that:

‘Many of the expressed values which dominated the first two days of the conference, particularly the child centred model with its emphasis on expression, feeling, inner development and nurture, seemed blasted by the cold air of rational modernism.’[165]

[162] Barclay Russell’s minutes for the conference are stored at the National Arts Education Archive, Bretton Hall. Yeomans’ discussion can be found in: Yeomans, R. R. "Basic Design and the Pedagogy of Richard Hamilton". In Romans, R. (ed) *Histories of Art and Design Education.* (2005) Intellect Books. London. p.195
[163] *Ibid.* p. 195
[164] See Read, H. (1967) *Education Through Art.* Faber and Faber. London.
[165] Yeomans, R. (1988) “Basic Design and Richard Hamilton’s Teaching”. *The Journal of Art and Design Education.* Vol. 7. No. 2. 1988. pp. 155-156

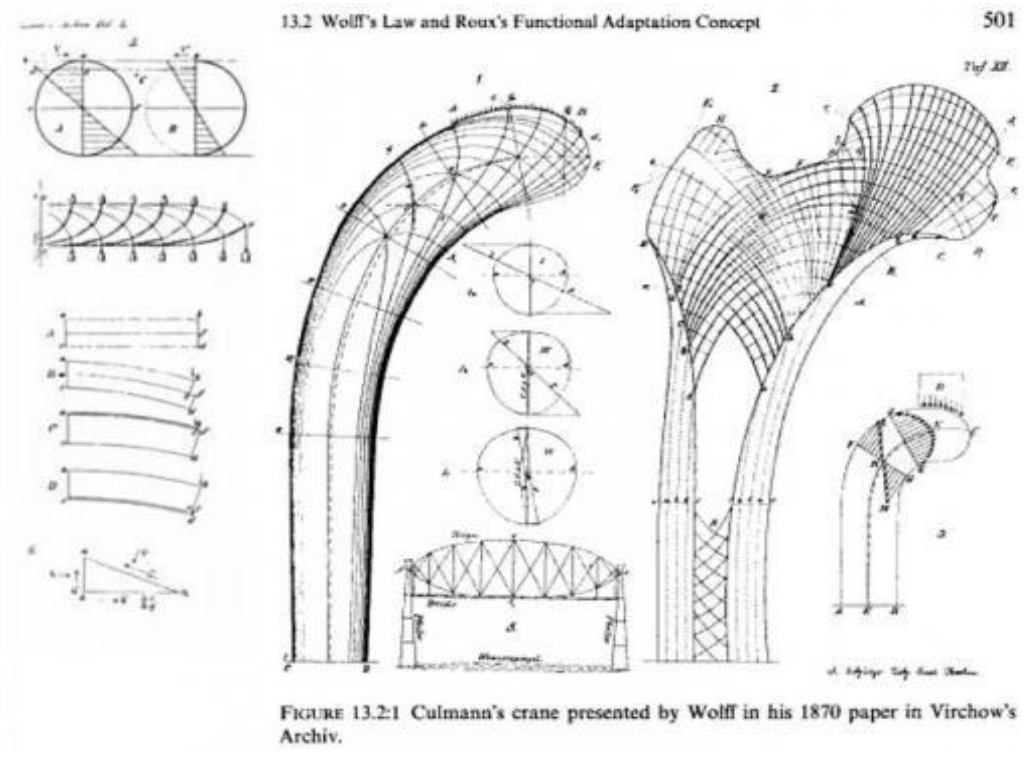
While some educators, including Veronica Zabel and Barclay Russell, defended the intuitive and individuated understanding of 'education through art' that had shaped art education since World War II, there was also a notable backlash. Interestingly, Maurice de Sausmarez raised the point that the intellect needed to be developed as part of training, and felt that this had been neglected.[166] Bearing in mind that the conference took place at the height of expressionist painting, this argument for an art training that shaped the intellect is particularly pertinent. The tide was turning on the autonomy of the individual artist, and a more interrogative approach was proposed by several individuals at Bretton Hall that year. In addition, Harry Thubron argued for an art education that would address the science and technology of the modern world, proposing that secondary students should have access to modern machinery and equipment instead of being offered outmoded crafts.[167]

The tension between the technology and machinery of the modern world and the abstract emotion and individuated sensibility of expressionism was palpable in this forum for the educators of the day. Maurice de Sausmarez's argument for educating the intellect, alongside Thubron's belief that artists should engage with the technology and culture of the contemporary world, demonstrated a profound change of values. Expressionistic art was a kind of antithesis to the machine as it was by nature handmade, individual, emotional and essentially human. However, art as an intellectual exercise, engaging actively with the technologies of the day, has a clear relevance to the hard edge and constructivist tendencies which were part of the Basic

[166] *Ibid.* p. 156
[167] *Ibid.* pp. 155-156

Design movement's technical approaches. By then, these styles were clearly manifested in the Basic Design movement, particularly in Leeds and Durham.

1.3. Systems and Basic Design at King's College



Culmann's Crane: illustration from D'Arcy Wentworth Thompson's O*n Growth and Form*

i) Hamilton and Pasmore at King's College

It was Hamilton's move in 1954 from the Central School to King's College, University of Durham that started the Basic Design practice there. He was hired to teach both commercial design and to help students understand its synthesis with the fine arts too. That same year, Victor Pasmore was recruited by Professor Lawrence Gowing to head up the painting course. Hamilton was already in post, running his basic courses in the design department and undertaking some limited teaching within fine art from then until 1966. The two men had different ideas about teaching abstraction, but each in their own way confronted the key issue of art in a mechanical age. Over time, Hamilton's role developed so that he eventually led the 'basic course' for both artists and designers once it had fully evolved.

Pasmore worked primarily with fine art students, but he also had an instrumental role in advocating the basic courses, as well as in bringing together the individuals from Leeds and Durham who were experimenting with the new techniques. There is much evidence within the anecdotal and critical histories of Basic Design that teaching staff treated their classes almost as an extended practice, using the students within a broader agenda of interrogation of abstraction. In his short paper about Basic Design at King's College, Durham, Richard Yeomans notes that:

> 'This drive towards experiment was spearheaded by Victor Pasmore who regarded the art studio as a laboratory where his teaching went hand in hand with his own creative research.'[168]

[168] Yeomans, R. *The Pedagogy of Victor Pasmore and Richard Hamilton.* Typescript of paper delivered at the Henry Moore Foundation on Nov 4 2009: Accessed 01/11/11 at: http://www.henry-moore.org/docs/yeomans_basic_design_0.pdf. p. 9

As a former student of Basic Design at King's College, Yeomans experienced first-hand Pasmore's approach to teaching as an extension of his own experimental practice.[169] This issue will be explored further in the chapter with regards to Pasmore's own conception of abstraction and how this fed into Basic Design pedagogies. Despite Hamilton and Pasmore having divergent approaches to both teaching and their own art practice, there were several formal links between what they achieved under the banner of Basic Design. For example, Pasmore's intuitive mark-making activities led to an exploratory manipulation and repetition of form which had much in common with Hamilton's more analytically driven approach to the same exercise. Despite Pasmore's intuitive brand of abstraction, he had many of the same theoretical and formal influences to Hamilton – particularly mechanical biology, which is explored in depth within this chapter.

ii) Sigfried Giedion and Mechanics in Culture

Mechanics are vital to any interpretation of the Basic Design movement – both mechanical developments in the twentieth century and also the cultural and philosophical shift that mechanical technologies created. Richard Hamilton recalled that:

'Sigfried Giedion's *Mechanisation Takes Command* became a primary source book immediately after its publication in 1948. It was particularly significant for me in that it complemented *On Growth and Form*, which deals with the natural world in just the wide-ranging manner of Giedion's perception of technological form and process.'[170]

Mechanization Takes Command has been explored in relation to Hamilton and other members of the Independent Group, particularly concerning the 1955 ICA exhibition

[169] While Yeomans compares Pasmore's approach to Kandinsky's notion of the 'art laboratory' at the Bauhaus, it developed more from Pasmore's own relatively recent conversion to abstraction.
[170] Hamilton, R. (1982) *Collected Words 1953-1982*. Thames and Hudson. London. P. 12

Man, Machine and Motion – and it is clear that Hamilton himself recognised its importance to his own oeuvre.[171] However, as the statement above demonstrates, Hamilton read Giedion in tandem with *On Growth and Form,* directly before he started work on the 1951 Institute of Contemporary Arts exhibition of the same name. This fusion of technological and biological sources during the period is extremely important, particularly as so often the biological and the mechanical are viewed in contrast, in the same binary as urban/rural, natural/manmade – a completely false distinction that is still problematic today. In the introduction to their 2011 book *Biocentrism and Modernism,* Oliver A. I. Botar and Isobel Wünsche wrote:

'When not ignoring the interconnections between nature-centric ideology and Modernism, historians were denying it, emphasizing, instead, its anti-natural, so-called "mechanistic" aspects.'[172]

As the current interest in the rich and complex interface between modernism and biology grows, so the revisionist histories of modern painting and sculpture emphasise the problematic offset of the mechanical *against* the biological. However, mechanics are as relevant to the plant as to the machine, to systems of all kinds, since mechanics in its truest sense is the mathematics of motion or forces. This understanding has somewhat paled because of the broader cultural association between mechanics and "the machine", an emblem of the transformative technologies of the modern period.

---

[171] See Jurgen, J. *Die Entwicklung der Pop Art in England ... von ihren Anfdngen bis 1957-Das Fine-Popular Art Continuum* (Frankfurt: Peter Lang, 1986); Leach, D. *Richard Hamilton: The Beginnings of His Art* (Frankfurt: Peter Lang, 1993); Massey, A. *The Independent Group: Modernism and Mass Culture in Britain*, 1945-1959 (Manchester and New York: Manchester University Press, 1995*);* Moffatt, I. (2002) *The Independent Group's Encounters with Logical Positivism and Searches for Unity in the 1951 Growth and Form Exhibition.* PhD Diss. MIT. *The Independent Group: Postwar Britain and the Aesthetics of Plenty,* ed. Robbins, D. (Cambridge: MIT Press, 1990); and Whitham, G. "The Independent Group at the Institute of Contemporary Arts: Its Origins, Development, and Influences 1951-1961" (PhD. diss., University of Kent at Canterbury, 1986)

[172] Botar, O. A. L. & Wünsche, I. (2011) *Biocentrism and Modernism.* Ashgate. Aldershot. p. 1

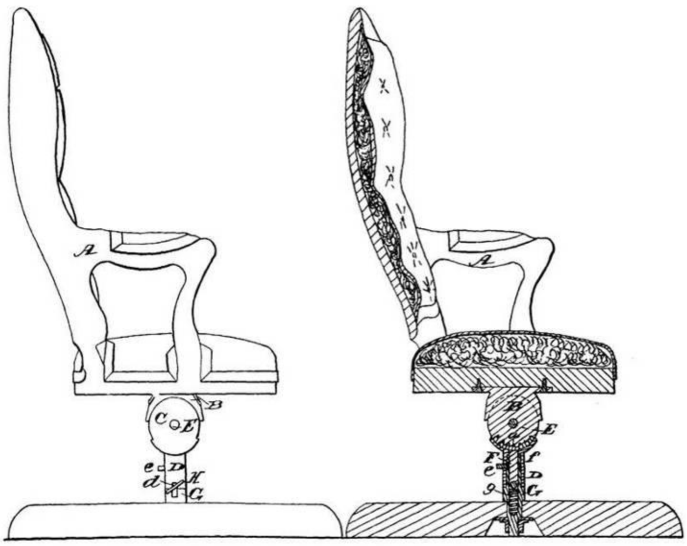
In his earlier book, *Space Time and Architecture*, Giedion argued that there was a split in the modern world between thinking and feeling – in *Mechanization Takes Command*, he wanted to explicate this cultural schism by charting the primacy of machine technologies over the arts since the 19th century. This is a reflection of a dichotomy that was concretised in the interwar period – thinking as the realm of science and feeling as the realm of the arts. Drawing on the particular brand of ephemera produced by manufacture and engineering, Giedion's enormous book included analysis and illustrations of forgotten patents, catalogues and diagrams for manufacturing processes and tools, as well as research equipment from the biological sciences. In salvaging and accounting for these frail documents, Giedion created a record of mechanical infiltration; the machine shaping every aspect of the modern world.

Giedion's book perhaps anticipated the schism that was developing between science and the other disciplines. Figure 7, on page 108, shows two illustrations from *Mechanization Takes Command*, the first a patent for adjustable railway seats, the second for a reclining chair. A long-term admirer of le Corbusier, Giedion had a sustained interest in the ways in which design and architecture could respond efficiently and harmoniously to the proportions of the human body, and this is reflected by these examples of ergonomic design. He titled his history as 'anonymous' as it focused on the under-sung and often authorless production of mechanical solutions to problems or processes. He explored diverse areas of contemporary mechanics, including biology, architecture and design, writing that:

‘For the historian there are no banal things. . . . Tools and objects are outgrowths of fundamental attitudes to the world.’[173]

This point has immediate resonance with Hamilton’s practice, both as an artist and as an educator. This was never clearer than in the ‘Analytical Drawing’ exercises undertaken by Basic Design students under Hamilton’s tuition, reflecting the cultural significance of mechanical form, as emphasised in *Mechanization Takes Command.* The common use of the term ‘analytical drawing’ in the period is worthy of attention given its implications of logical examination, breaking form down into constituent elements in order to understand its structure.

[173] Giedion, S. [1948] (1975) *Mechanization takes Command: A Contribution to Anonymous History.* Oxford University Press. Oxford.



275. Recumbent Seat for Railway Carriages, 1855. *Mounted on a metal disk clamped between two plates, tilting backward and forward, and swiveling.* (*U. S. Patent* 13,464, 21 *August* 1855)

276. Adjustable Railroad Seat, 1858. *Mobility is achieved by a system of slotted hemicircles and thumb-screws. The leg rest slides out telescopically.* (*U. S. Patent* 21,052, 27 *July* 1858)

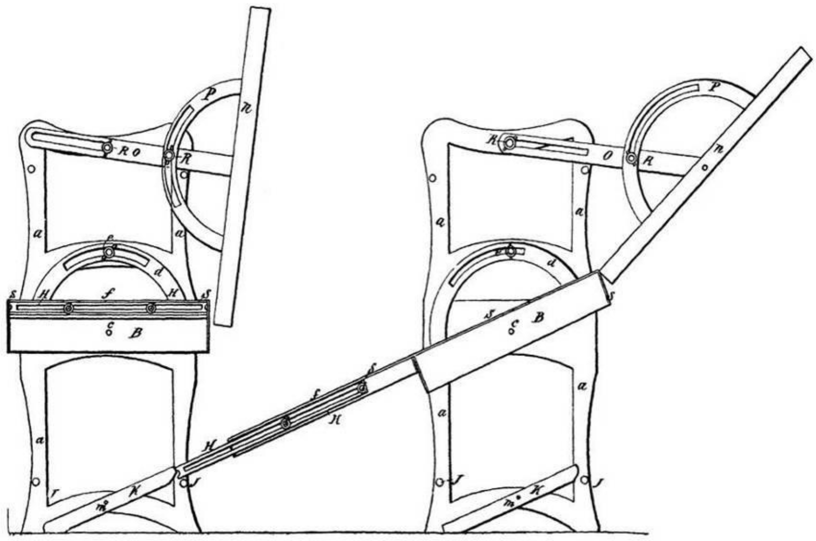


Figure 7: *Illustration of Adjustable Railway Passenger Seats and (Bottom) Adjustable Folding Chair for DC-3 Airliner.* In: Giedion, S. (1948) *Mechanization Takes Command*

Giedion was primarily a cultural historian, and his first book *Space, Time and Architecture* was the basis of the themes further explored in *Mechanization Takes*

Command.[174] Both caused a considerable stir in the creative and scientific communities, but not without criticism. After receiving a copy of *Space, Time and Architecture* from the architect Erich Mendelsohn, who was a critic of Giedion's ideas, Einstein responded in a private letter as follows:

'Dear Mr Mendersohn,

The passage you sent me from the book *Space, Time and Architecture* has inspired the following reply:

It's never hard some new thought to declare
If any nonsense one will dare
But rarely do you find that novel babble
Is at the same time reasonable.

Cordially yours, Albert Einstein.

P.S. It is simply bull without any rational basis.'[175]

Arthur Molella reflected upon this terse response in a 2002 article reviewing Giedion's two books. Commenting on the efforts of scientists in the interwar period to guard the boundaries of their discipline, Molella referenced Karl Popper's description of the problem of 'demarcation'.[176] In the crisis of knowledge after World War I, all disciplines went through a process of interrogation, reassessing the epistemological grounding of research in practice. While Einstein and many of his contemporaries resisted relativism in favour of traditional objectivity and rationalist approaches, the war had shaken the discipline beyond measure. Technological advancement is wholly dependent upon scientific research and the war had proven that technologies had the

[174] Giedion, S. (1941) *Space, Time and Architecture: The Growth of a New Tradition.* University of Harvard. Harvard.
[175] Cited by Molella, A. P. (2002) "Science Moderne: Sigfried Giedion's *Space, Time and Architecture* and *Mechanization Takes Command*". *Technology and Culture.* Vol. 43, No. 2 (April 2002) pp. 374-389. p. 377
[176] *Ibid.* p. 378

power to both protect the world and to tear it apart. The resulting schism can be read as a reaction to the possibility - and the terror - of the machine age.

iii) *On Growth and Form* and *Mechanization Takes Command*

As noted earlier, Hamilton drew from both Thompson and Giedion during the formative years which led to the *On Growth and Form* Exhibition. Hamilton noted that:

‘Agricultural machinery was seen by Giedion to be at a crucial interface, the boundary at which technology meets nature.’[177]

Figure 8 (overleaf) is a second illustration from *Mechanization Takes Command,* this time showing Oliver Evans’ mechanical grain mill, which he had taken from design to manufacture in the late 18th century. Giedion recounts the story, which involved rivalries between millers and an attempt to steal the idea, resulting in Thomas Jefferson being called in to mediate. Jefferson was not vastly impressed with this technological advance, as Giedion tells it:

‘…“The elevator,” he declared, “is nothing more than the old Persian Wheel of Egypt, and the conveyor is the same thing as the screw of Archimedes.”’[178]

---

[177] *Op. Cit.* (1982) P. 12
[178] *Op. Cit.* (1948) P. 84

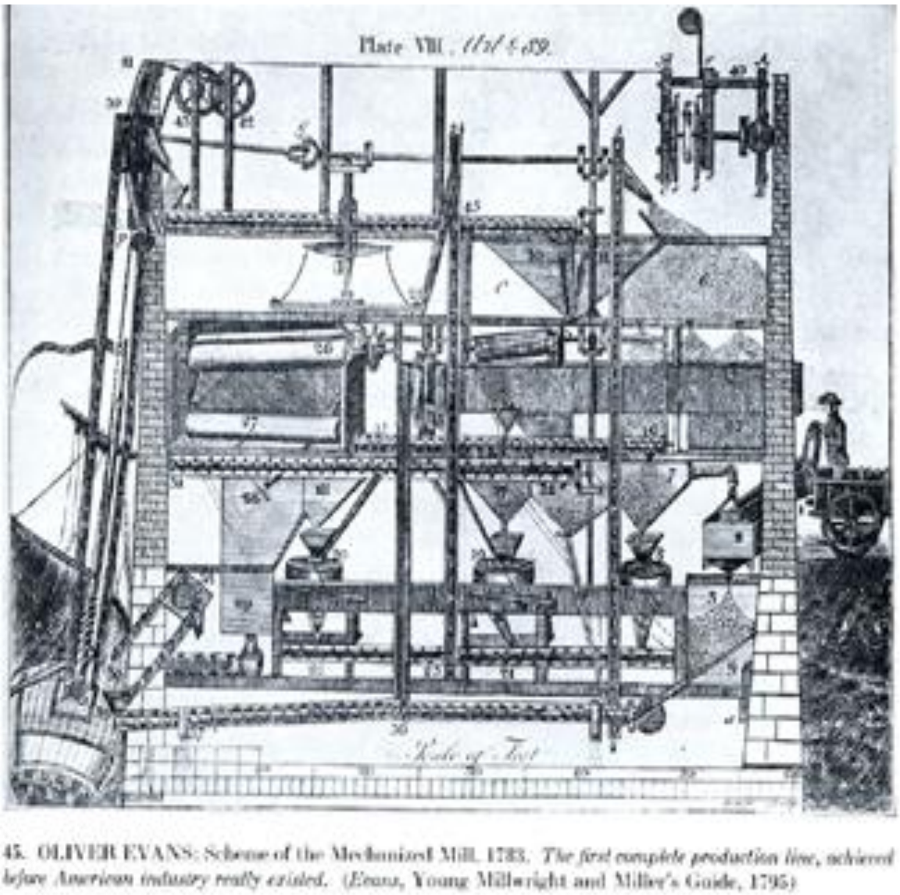


Figure 8: *Oliver Evans's Mechanised Mill*. In: Sigfried Giedion, *Mechanization Takes Command; A Contribution to Anonymous History.* Oxford University Press, Oxford. 1948. p. 83)

Jefferson connected the mechanical mill with the technological advances in ancient Egypt and Greece upon which it relied, rather than recognising the machine in its entirety as an innovation. For Hamilton though, agricultural machinery created a ‘crucial interface’ between nature and technology, which he directly interrogated in his series of Reaper prints of 1949 (see Figures 9 to 12, overleaf), as he recalls:

‘The initial stimulus for a series of twenty Reaper engravings, made at the Slade, undoubtedly came from Giedion's chapter on the farm implement.'[179]

[179] *Op Cit*, (1982) p. 12

In this series of sixteen prints Hamilton's reaping machine is reduced to a series of linear and connected lines; a grid that has the clear rationality of a patent diagram.

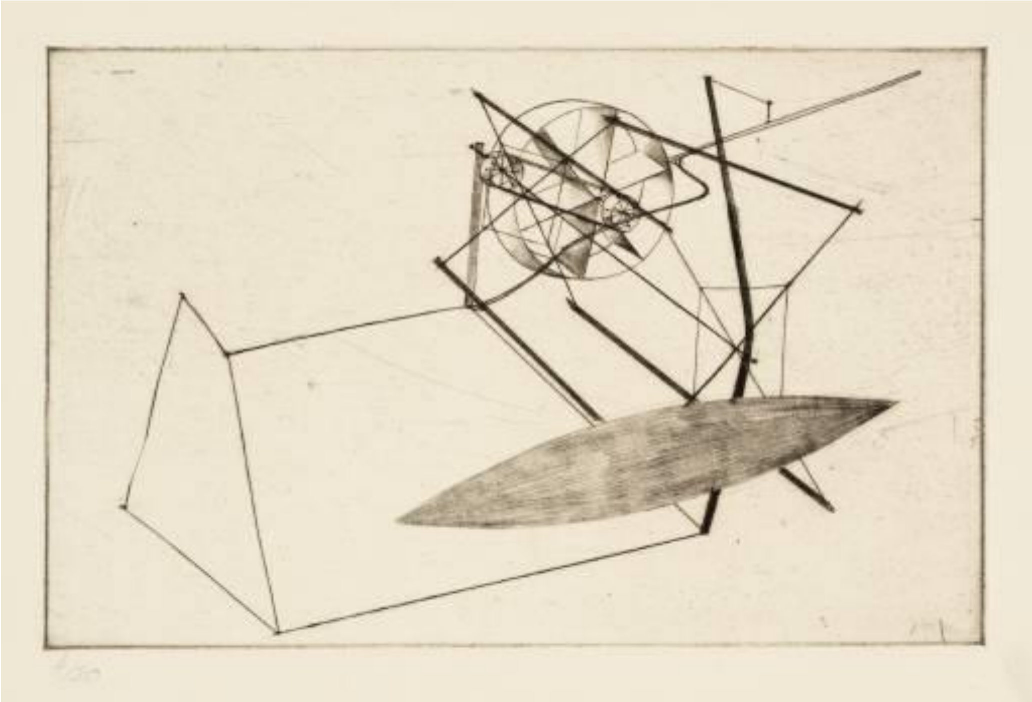


Figure 9: Richard Hamilton *Reaper (d)* (1949)
Intaglio print on paper, 173 x 270 mm, Tate Collection

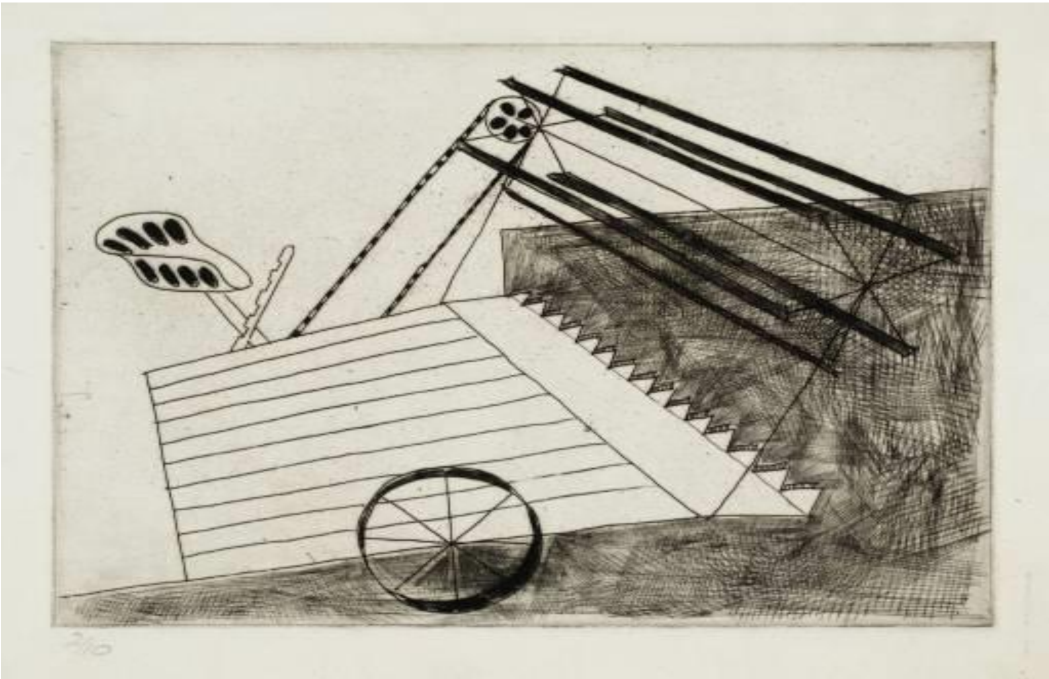


Figure 10: Richard Hamilton *Reaper (e)* (1949)
Intaglio print on paper, 175 x 222 mm, Tate Collection

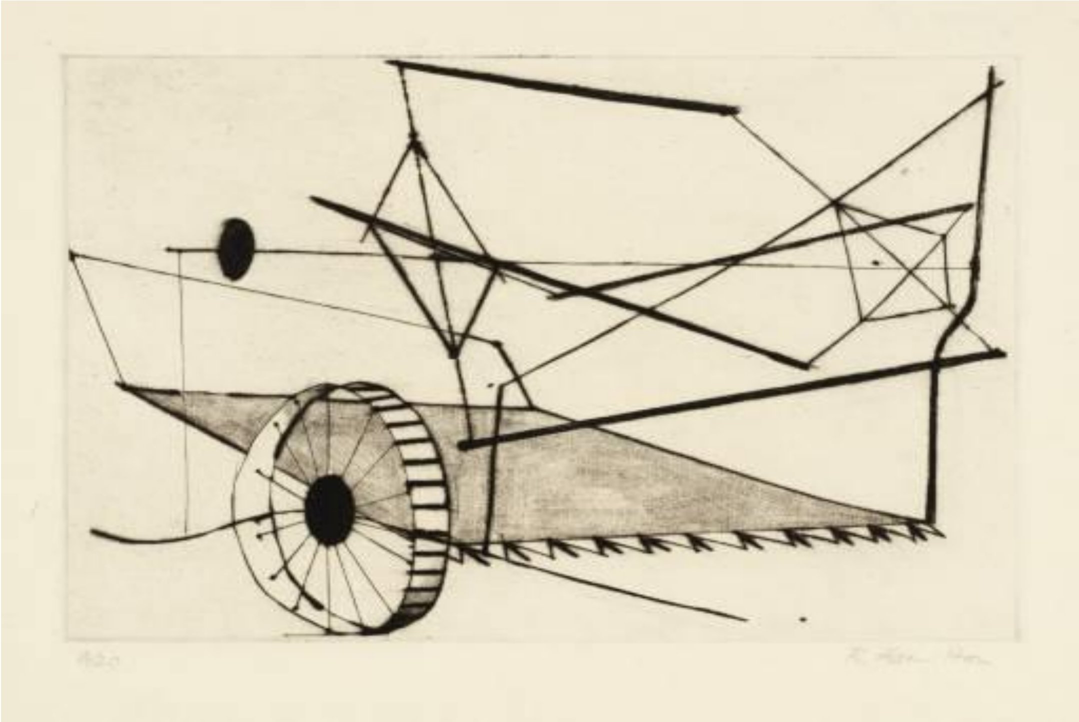


Figure 11: Richard Hamilton *Reaper (h)* (1949)
Intaglio print on paper, 171 x 247 mm, Tate Collection

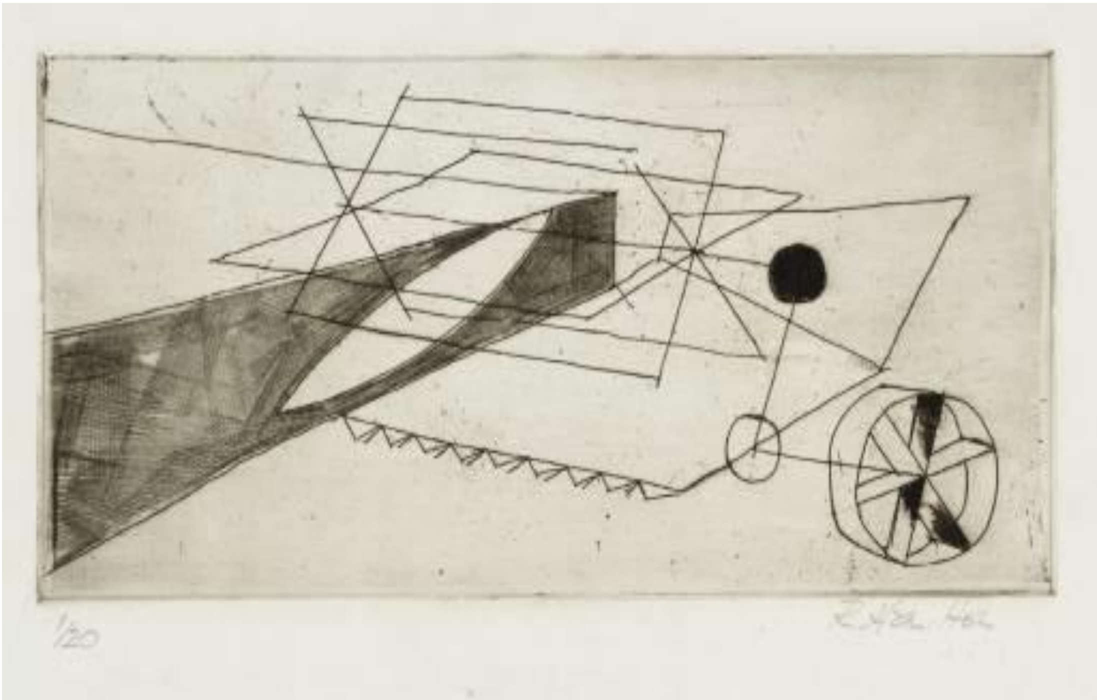


Figure 12: Richard Hamilton *Reaper (j)* (1949)
Intaglio print on paper, 99 x 225 mm, Tate Collection

In Figure 9, *Reaper (e)* the raw teeth of the machine meet the softness of the earth, but the linear relationship of ground to machine is harmonious, suggestive of the beauty of economical mechanical function. With seat, lever and reaping wheel frame reduced to geometric elements, the print emphasises the logic that underscores mechanical design: form to function, a structure designed for a task and nothing more.

Taken in parallel with *On Growth and Form* then, we can draw a clear comparison between Thompson's analysis of biological growth and Giedion's analysis of mechanical development. Both explore in diverse ways the defining factors of eventual form. Hamilton wrote that:

On Growth and Form…deals with the natural world in just the wide-ranging manner of Giedion's perception of technological form and process.[180]

What is crucial in terms of the importance of both authors to Hamilton's own development is the underlying language of form. The mechanical structures in the *Reaper* prints were both skeletal and diagrammatic: the relationship between technology and nature fused, complete and efficient. Mechanical structure here mirrors biological structure because for Hamilton, both had the same rational basis for their eventual form. Figures 13 and 14 (overleaf) are illustrations from Giedion's chapter on the mechanisation of agriculture, showing the patent diagram and an etching for McCormick's Virginia reaper. Both images demonstrate the extent of the influence – both visual and philosophical – which Giedion's book had for Hamilton. Their relationship with the *Reaper* print series is clear. The patent diagram reduces the design to a modernist structure of lines and the woodblock print shows a reaper in use, the

[180] Hamilton. *Op. Cit.* (1982) p. 12

machine harmoniously integrated into the farmland around it. Nature and technology meet seamlessly.

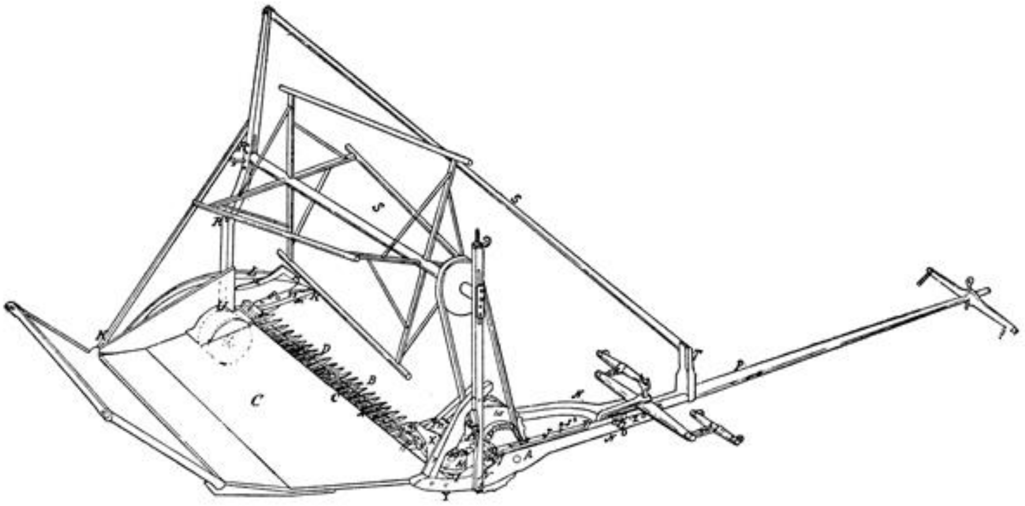
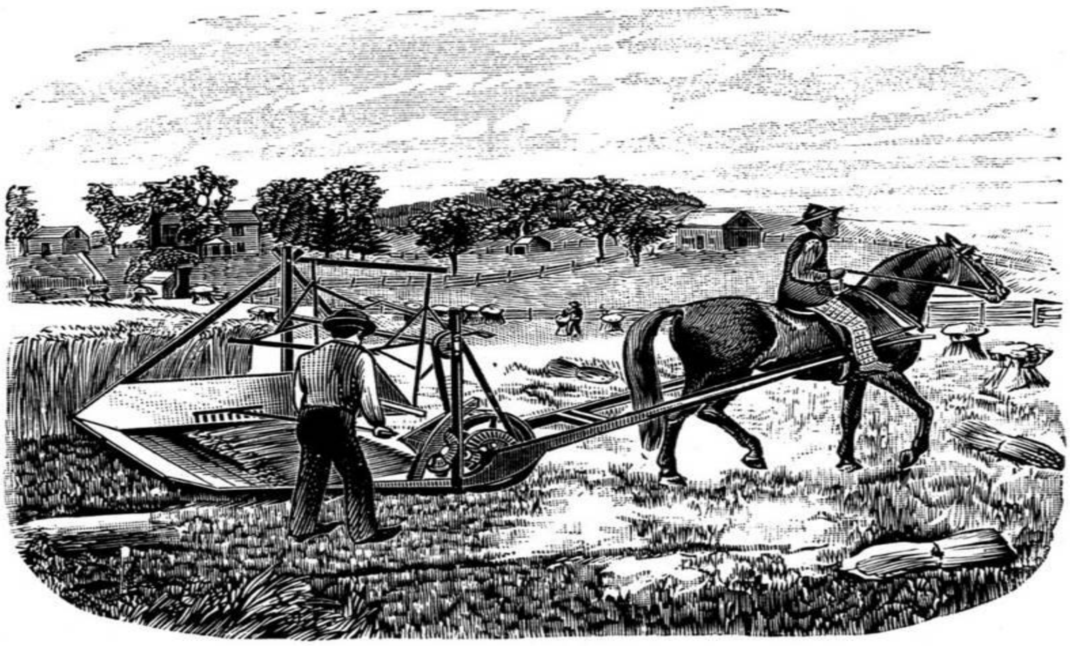


Figure 13: *McCormick's First Reaper Patented January 31, 1845*
Reproduced in Sigfried Giedion *Mechanization Takes Command,* 1948, p. 135



THE FIRST PRACTICAL REAPER.
Invented and built by Cyrus H. McCormick in 1831.

Figure 14: *McCormick's Virginia Reaper. (1846).* Reproduced in Sigfried Giedion *Mechanization Takes Command: A Contribution to Anonymous History.*1948. p. 135

iv) Basic Design Analytical Drawing Exercises and Design Patents

Like ‘grammar of form’, the key term ‘analytical drawing’ was prominent within the Basic Design movement, as used by Kandinsky for his elementary drawing classes at the Bauhaus. However, Kandinsky’s analytical drawing classes of the 1920s were focused on the exploration of the relationship between forms, deducing the geometry and spatial arrangements through a series of staged exercises, most often based around the relational forms within a still life arrangement.[181] Also, analytical drawing formed the culmination of basic design exercises, the point to which other simpler exercises in point and line led. The practice of Analytical Drawing within the Basic Design movement demonstrated a strong influence from the growing discipline of Industrial Design, as well as a mechanical focus on objects, colour and form. I will explore the difference between Kandinsky’s and Basic Design’s strains of Analytical Drawing in order to evidence their separate agendas before looking at the latter in the context of patent design.

The most notable visual difference between Kandinsky and the Basic Design movement’s strain of analysis was a simple visual quality – the Basic Design outcomes had a quality of dissection, of parts laid out, scrutinised and labelled. This was essentially the place which still life had traditionally occupied in fine art training but by the 1950s, both the terminology and the subject matter were distinct from this tradition. Much as the convention of still life allows us an insight into the values and preoccupations of the age, so do these basic exercises in analytical drawing. Below are

[181] Poling, C V. (1987) *Kandinsky’s Teaching at the Bauhaus.* Rizzoli. New York. pp. 106-113

Figures 15 and 16, comparing analytical drawings by students of Richard Hamilton at King's College and Kandinsky at the Bauhaus:

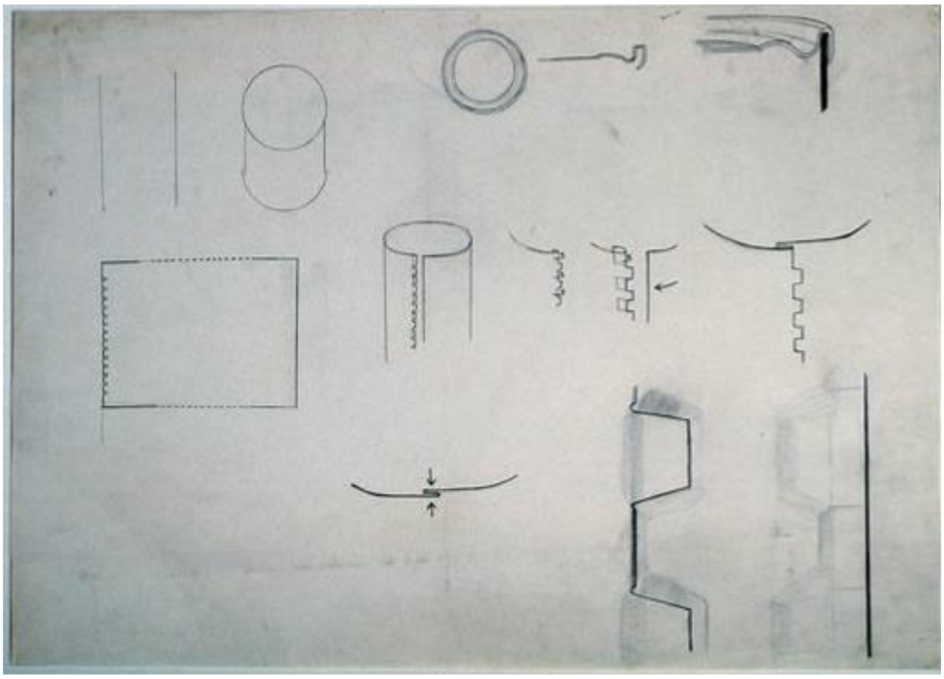


Figure 15: Mark Lancaster (student of Richard Hamilton) *Analytical Drawing* (1965) King's College, University of Durham

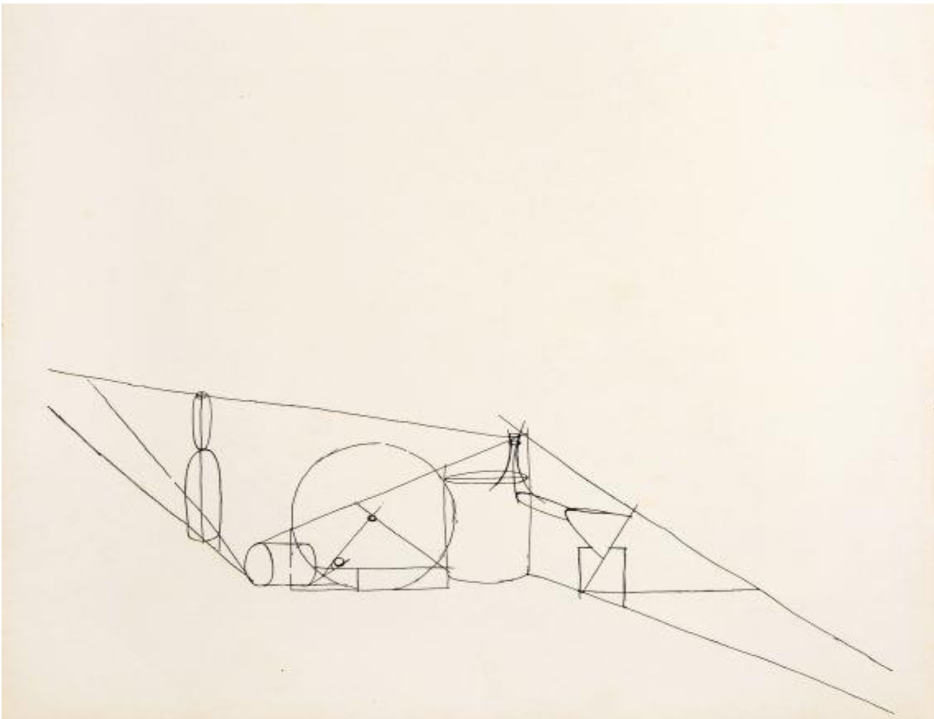


Figure 16: Maria Rasch *Analytical Nature Drawing* (1922)
Rasch Archive

The two figures demonstrate the difference between the focus on composition and spatial arrangement in Kandinsky’s classes to the analysis of structure and form favoured by Hamilton. In Mark Lancaster’s student work from King’s College, the subject matter appears to have been the construction of a tin can. It was laid flat to map its exact proportions, the ‘zipper’ system of joining, folding and sealing the metal scrutinised. According to Richard Yeomans, students were encouraged to choose objects which meant something to them for analysis; the popularity of mechanisms must in part be attributed to Hamilton’s own interests and influence.[182]

Each study of structure or line was placed independently on the page; this was not a drawing to be read as a whole, rather a series of formal studies. In the Bauhaus study by Maria Rasch, the focus was unity, geometry and the connection between forms in space. It implies a kind of spatial rationalism that did not come across in the analytical drawing by Hamilton’s students. Rasch’s drawing was one of a series of drawings completed in phased stages by Bauhaus students, from observing the arrangements of forms in a still life to mapping the underlying geometries in a spatial context.

The term ‘Analysis’ implies a search for some kind of advanced or empirical understanding and for both movements an empirical approach to visual form and perception was paramount. The Basic Design exercise overleaf (Figure 17) has the look of a mechanical dissection, machine parts laid out and the possible movements of components suggested with arrows. While this process might be explicable for the engineering student, its place within the fine art and design curriculum is curious. Read

[182] Yeomans. *Op Cit.* (1987) p. 266

in line with Giedion's statement that 'tools and objects are outgrowths of fundamental attitudes to the world', then this art school focus on machine components and movements is a measure of the contemporary significance of the mechanism.[183]

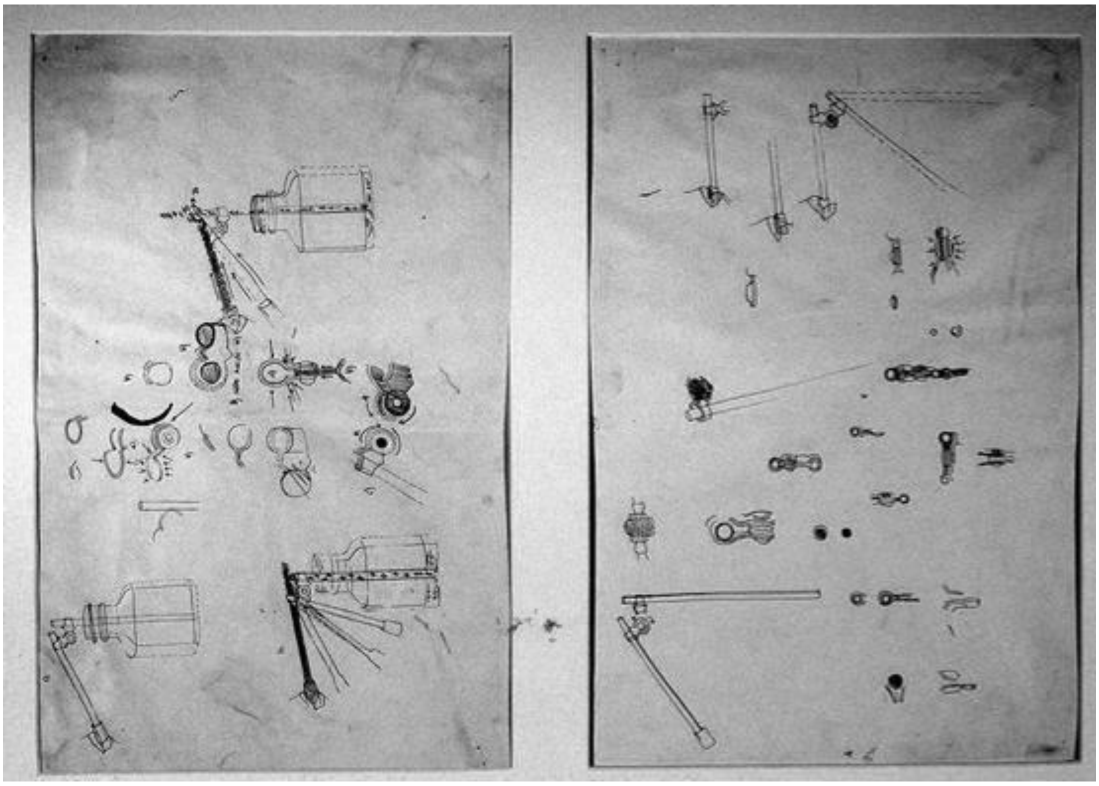


Figure 17: Unknown Student of Richard Hamilton. (1965) *Analytical Drawing.* King's College, University of Durham. NAEA.

This student illustrated the movements of mechanical parts and the forms of components much as an engineer might – and much in the manner of the design patents shared by Giedion in *Mechanization Takes Command.* Figure 18 (overleaf) shows a similarly analytic approach to mechanical form from S. Creaney, another student of Basic Design at Durham. This is a drawing which explores function, but in doing so it also highlights the perfect geometry of the change ball mechanism. On the following page, Figure 19 (page 113) is another illustration from Giedion's *Mechanization Takes*

[183] Giedion. *Op. Cit.* (1948)

Command, a patent design for a railway dining carriage in which it is shown from every angle in order to map out its structure. This same level of analysis is present in the student drawing of the change ball mechanism.

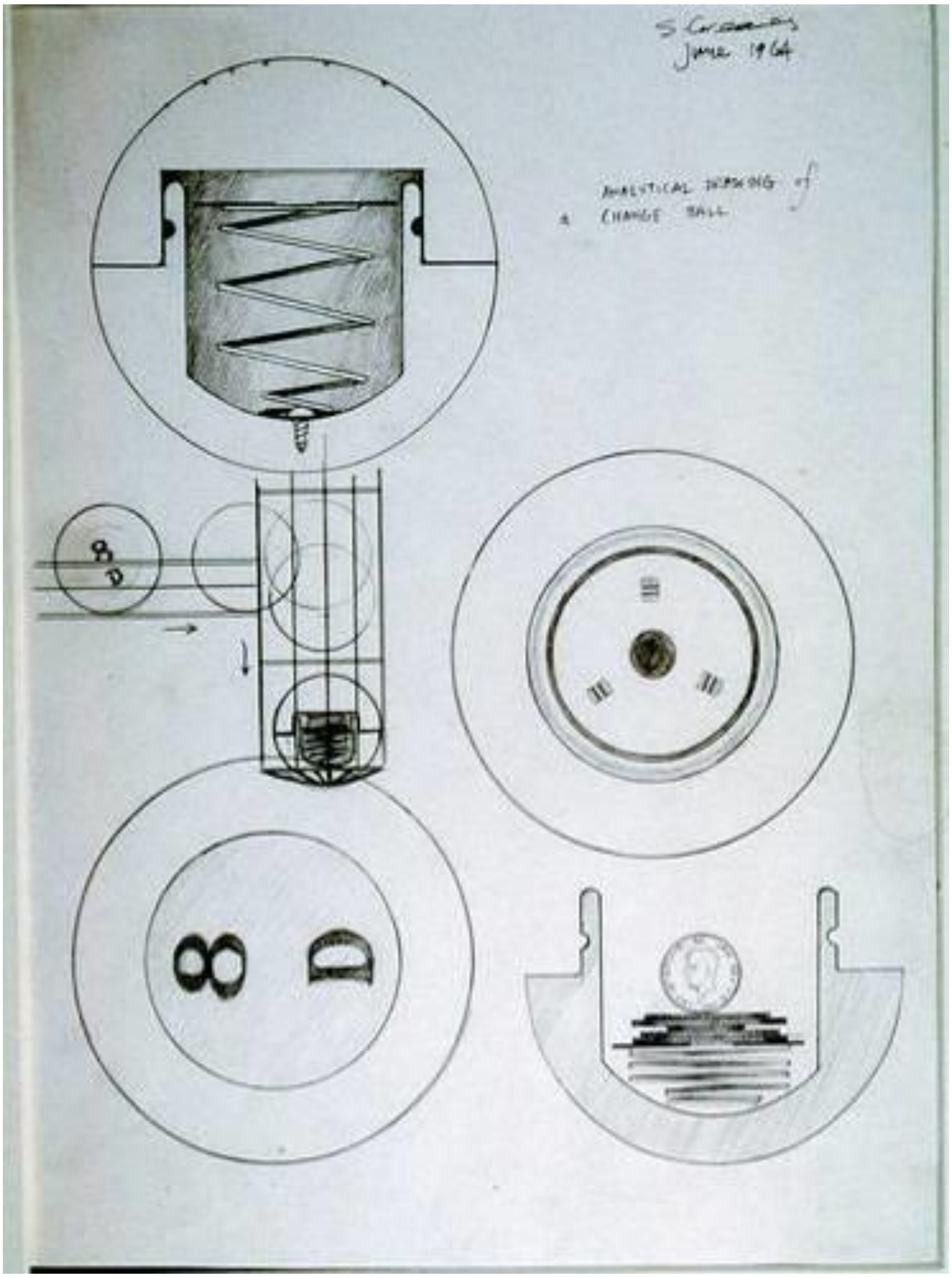
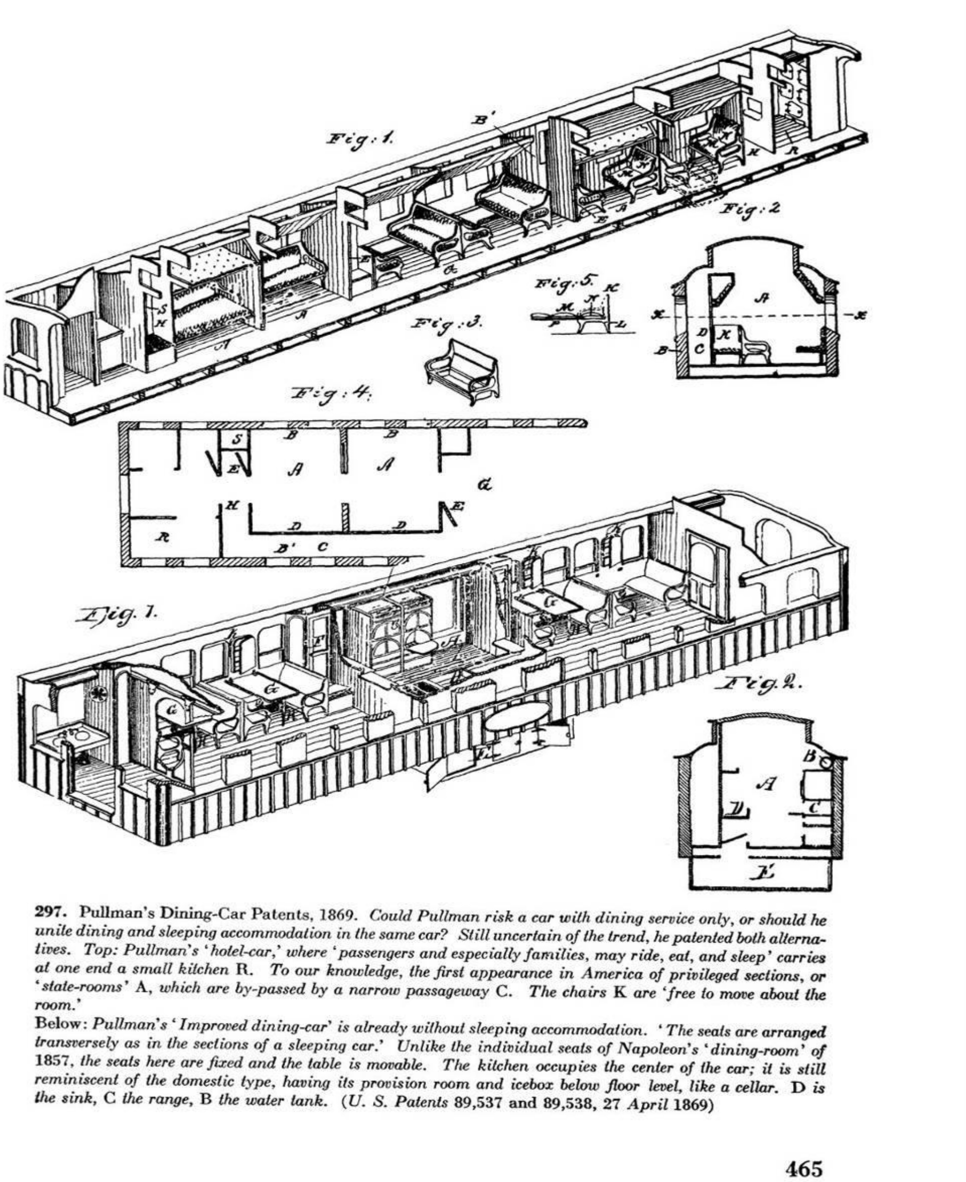


Figure 18: Creaney, S. (student of Richard Hamilton) (1964) *Analytical Drawing of a Change Ball.* King's College, University of Durham. NAEA.



297. Pullman's Dining-Car Patents, 1869. *Could Pullman risk a car with dining service only, or should he unite dining and sleeping accommodation in the same car? Still uncertain of the trend, he patented both alternatives. Top: Pullman's 'hotel-car,' where 'passengers and especially families, may ride, eat, and sleep' carries at one end a small kitchen* R. *To our knowledge, the first appearance in America of privileged sections, or 'state-rooms'* A, *which are by-passed by a narrow passageway* C. *The chairs* K *are 'free to move about the room.'*

Below: *Pullman's 'Improved dining-car' is already without sleeping accommodation. 'The seats are arranged transversely as in the sections of a sleeping car.' Unlike the individual seats of Napoleon's 'dining-room' of* 1857, *the seats here are fixed and the table is movable. The kitchen occupies the center of the car; it is still reminiscent of the domestic type, having its provision room and icebox below floor level, like a cellar.* D *is the sink,* C *the range,* B *the water tank.* (*U. S. Patents* 89,537 and 89,538, 27 *April* 1869)

465

Figure 19: Anon. *Cutaway Drawing of Pullman Car*. (From Giedion, S. *Mechanization Takes Command* 1948).

The rationalism of the Industrial Designer's drawing practice thus formed a significant element of Hamilton's teaching at King's College. As noted earlier in this case study, this era saw intensive growth in industrial and graphic design, including the coining of the latter phrase. Figure 20 (overleaf) shows a dressing table designed by Central

School student Dorothy Lee, which was selected for inclusion at the Council of Industrial Design's stand at a furniture exhibition in 1960. It used a collision of traditional and modern materials; teak and Formica. In the 1950s and 1960s, the relationship between the aesthetics of art and design were closer than ever before. At the Central School, this was indicative of the synthesis which had taken place at Central under Johnstone's leadership; an industrially oriented approach with strong Bauhaus undertones, intended to allow for transitions between subjects and the possibility of meaningful exchanges. This design has constructivist qualities in its dynamic angles and geometric planes that have a strong shared aesthetic sensibility with visual art of the period, including Basic Design teaching.

Figure 20: Dorothy Lee (student at the Central School). (1960) *Prototype dressing table in teak and 'Formica' plastic laminate.* Displayed at the Council of Industrial Design stand at the Furniture Exhibition. The Design Council/Manchester Metropolitan University

While the courses that Johnstone considered to be Basic Design teaching at Central categorically did not involve the later practitioners, including Pasmore and Hamilton, the design aesthetic at Central – the most cutting edge Industrial Design department in the country – must certainly have been familiar to its teaching staff. The issue of a shared aesthetic between the fine arts and design was fundamental to the Basic Design movement, and it came about in the early 1950s due to the desire to reinvigorate design, to make it reflect the modern world in the new age following the War. It was to be the age of consumer goods such as those featured in Figures 21 and 22, below and overleaf – the radiogram.

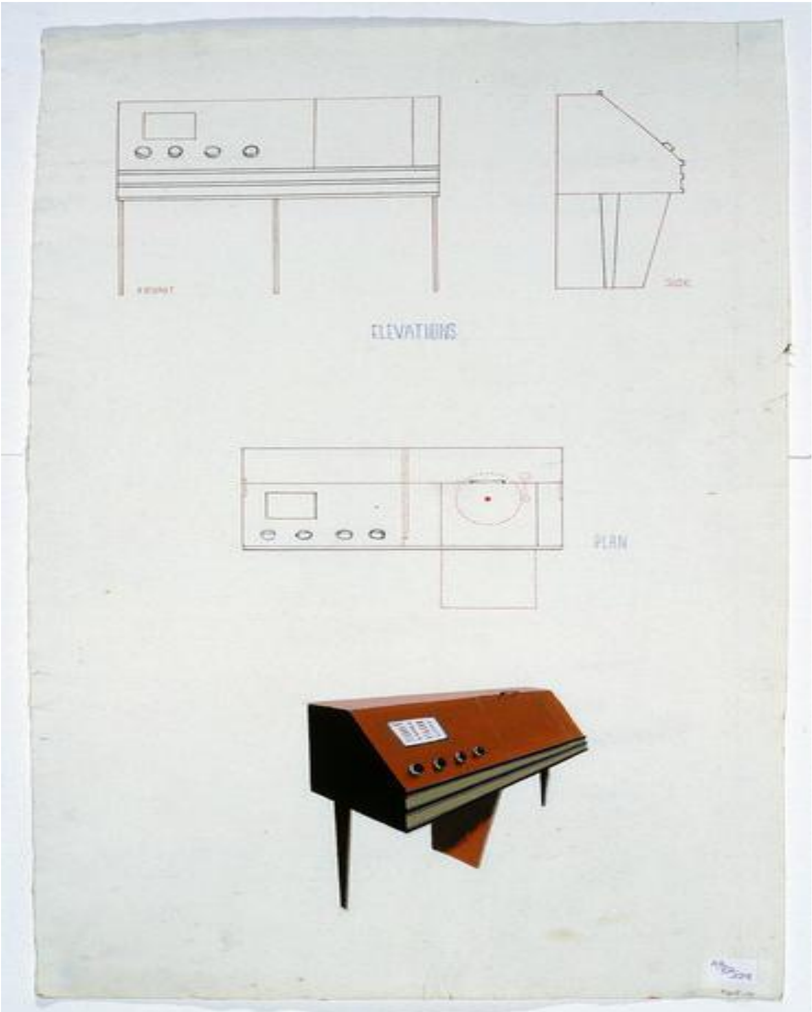


Figure 21: Tiffin. Student of E. A. Halliwell. (c. 1960) *Painting of a Radiogram showing Front and Side Elevations.* NAEA.

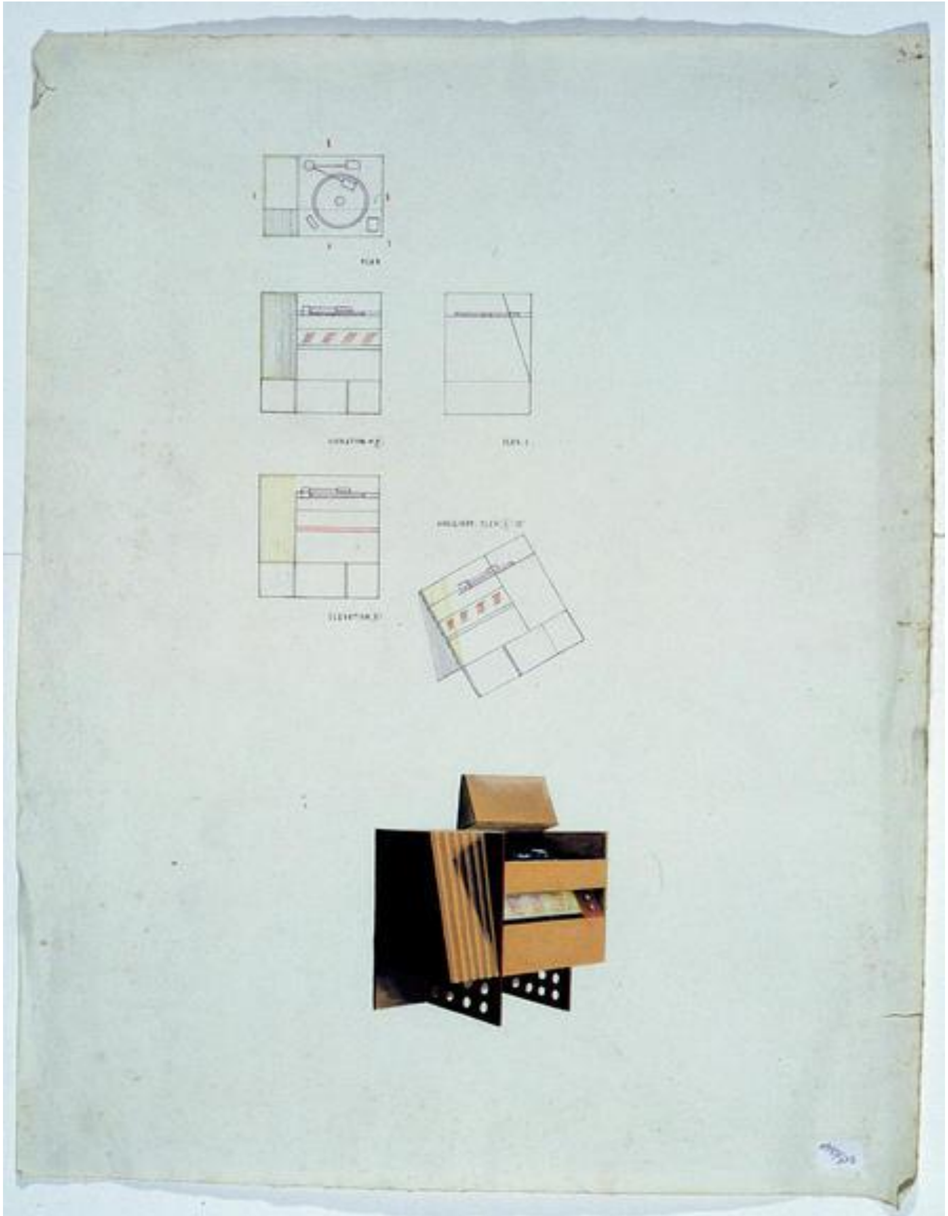


Figure 22: Unknown (student of A. E. Halliwell). (c. 1960) *Painting of a Radiogram showing Plans and Elevations.* NAEA.

Halliwell's posters and other ephemera were gifted to the National Arts Education Archive by his wife after his death, but the majority of this collection consists of examples of his own impressive practice in graphic design. These rare drawing exercises of radiograms, which combined a record player and a valve radio – show different angles mapped out diagrammatically, and a detailed and sharply painted image of what was, in the 1950s and 1960s, a domestic appliance of widespread and ordinary appeal, as top-end stereo systems are today. Halliwell very much embraced the modern suburban dream, living in a modern house with up-to-date appliances and furnishings. This was something about which William Johnstone was a little patronising, despite his own vocal contribution to fostering all branches of Industrial Design.[184] In this exercise, the angles of this commercial object were translated into the dynamic contrast and limited palette necessary for lithographic printing in advertising, and in turn essential in the development of Pop Art. This work had interesting parallels with the Basic Design exercises arranged by Richard Hamilton in Durham. The aesthetics of technical design, particularly the graphic work undertaken by Halliwell, has clear parallels with the Basic Design aesthetic.

In this period of vital development, Hamilton was interested in domestic and leisure technologies and artefacts - his students thus drew juicers, tubes of toothpaste, tins, and the mechanisms from toys and appliances. There is a legacy here to the mapped out radiogram drawings by students of Halliwell at Central, but there is also a curious detachment about Hamilton's strain of analytical drawing, as well as a focus on the kind of ordinary technologies that flooded the home in the post-war years. Giedion had noted that artists:

'...resort to elements such as machines, mechanisms, and ready-made articles as some of the few true products of the period, to liberate themselves from the ruling taste'.[185]

---

[184] This comes through in Johnstone's autobiography *Points in Time*, as well as in a letter from a friend in the William Johnstone Archive at the National Library of Scotland. Dep. 322/2. The tone of the letter indicates Halliwell's suburban lifestyle was something of a running joke.
[185] Giedion. *Op Cit.* (1948) p. 44

This was the golden age of the domestic appliance and while the focus on Hamilton's vital early influence in pop art is most often tied to advertising imagery, the objects themselves were just as important. The advertising industry capitalised on the desire for new and exciting products, reflecting the thirst for modern style, design and innovation over quality and durability. The artefacts explored by Hamilton's students were not only chosen to provide analyses of structure, but they were also vital symbols in themselves of the increasing mechanisation of ordinary life. Even in domestic settings, the complex extension of human possibility through mechanics was clear.

v) Richard Hamilton and *On Growth and Form*

While Hamilton was still a student at the Slade, he met Nigel Henderson who first introduced him to *On Growth and Form.* The book quickly became an obsession, and occupied much of his remaining time at the Slade. The *Reaper* prints were made directly prior to Hamilton's larger project – the exhibition *On Growth and Form* which he proposed and developed for the ICA. The exhibition explored the underlying philosophy of biological structuralism which Thompson had offered as an alternative to the prevalent, and in his view limiting, interest in evolution.

It brought together cutting edge imagery such as photomicrographs as well as scientific models and films, alongside abstract art with relevance to biological structure. None of this work was labelled, to allow for meditation upon the visual and formal qualities of the selected exhibits. In his initial proposal to Herbert Read in 1949, Hamilton pitched his ideas:

'The initial stimulus for the proposed exhibition was provided by Thompson's book On Growth and Form. The visual interest of this field, where biology, chemistry, physics and mathematics overlap was considered an excellent subject for presentation in purely visual terms. The laws of growth and form pertaining to the processes of nature are quite contrary to the processes of artistic creation. However complex the form (accepting Thompson's hypothesis) it is the result of very precise physical laws; the complexities of art, on the other hand, are the products of involved psychological processes.'[186]

This tentative description of the overlap of arts and sciences shows an early formulation of Hamilton's engagement with the processes described in *On Growth and Form.* In comparing the 'involved psychological processes' of art to the 'precise physical laws' of form, Hamilton linked the two with Thompson's structured morphology.

[186] Hamilton, R. (1949) *On Growth and Form* Proposal for Herbert Read. Tate Gallery ICA archive. TGA 955. 1. 12. 26. Also reproduced in Jurgen Jacob. (1986) *Die Entwicklung der Pop Art in England* Peter Lang. New York.

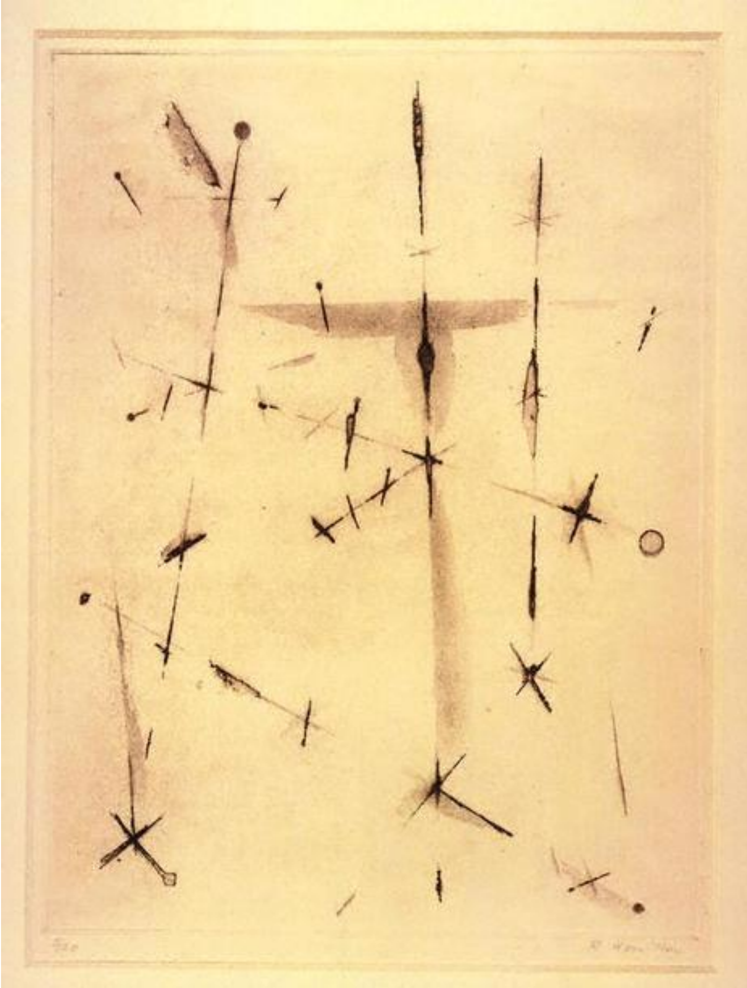


Figure 23: Richard Hamilton. (1950) *Structure.* Liftground etching and aquatint on paper. Slade School of Art Collection.

Figure 23 (above) is *Structure*, one of a series of prints he made at the Slade which explored the concepts he had gleaned from D'Arcy Wentworth Thompson. Here he explored repetition of marks to create structured form and composition, relating to growth patterns in the natural world. The outcome has a network quality, the suggestion of lines connecting the decisive, incision-like crosses on the paper – there is a strong suggestion of the series of decisions that led to the finished abstract image. This print gives a useful insight into Hamilton's reductive approach to abstracting Thompson's descriptions of growth patterns. Hamilton further developed his ideas about *On Growth and Form* into a formal proposal, the subject headings of which were:

'1. Time as a dimension of form
2. Forms of cells
3. Cell groupings
4. Skeleton structure
5. Related forms
6. Form and mechanical efficiency
7. The formal realisation of pure mathematics'[187]

This formed the basis for the ICA exhibition, and it offers an interesting illustration of the multidisciplinary approach upon which the ICA was conceived. It is not only the arts and sciences collaboration that made this exhibition an important event, but also that all the scientific disciplines are represented together, exploring the same themes of mathematical structure and growth in the natural world. Note that this linked set of subjects includes 'form and mechanical efficiency', a subject which relates both to Thompson's entreaty to refer all form 'to mechanism' and also Giedion's discussion of how biological science had been altered by the mechanisation of society. This link with Giedion was made explicit by Hamilton himself, when in his initial proposal for the ICA exhibition he wrote:

'The most obvious benefits of the exhibition would be the influence it may have upon design trends. The general implications are very wide: S. Giedion in his study of mechanization says 'The evolution from material and mechanistic conceptions must start from a new insight into the nature of matter and organisms'. The exhibition should also make its contribution in this direction.'[188]

---

[187] Hamilton, R. *Growth and Form Exhibition, First Draft Schedule*, ICA Papers, Tate Gallery Archive 955.1.12.26, also reprinted in Jacob. J (*ibid.)* He dates this to 1949, slip page at Tate marked Dec 1950
[188] Hamilton, R. (1949) *Draft Proposal for On Growth and Form.* ICA Archives. p. 1. Also cited by Massey, A. (1995) p. 44.

Figure 24: Installation View, *On Growth and Form.* (1951)
ICA archive, Tate Gallery

Figure 24 (above) shows the only installation shot of *On Growth and Form* that is publicly available. Isobel Moffatt, in her 2002 PhD thesis *The Independent Group's encounters with logical positivism and searches for unity in the 1951 Growth and Form Exhibition,* stated that Hamilton himself hinted that he had more photographs in his own collection which he wasn't willing to make public.[189] The abstract screen structure in the foreground of Figure 19 is amorphous; reminiscent of cell structures, of bones and of rock formations. It was created by Hamilton as part of his exhibition design. Behind it, there are the open cubic frames that Hamilton used to display the

[189] Moffatt, I. (2002) *The Independent Group's encounters with logical positivism and searches for unity in the 1951 Growth and Form Exhibition.* Doctoral Thesis. MIT. Accessed Nov 2011 at http://dspace.mit.edu/handle/1721.1/17555?show=full

objects, and on the walls, abstract painted forms with the same amorphous quality of the screen – like bones, rocks or drops of water. This fusion of interdisciplinary objects and abstract imagery was a strategy Hamilton would employ again in his later exhibitions for the ICA, including *Man, Machine and Motion* in 1955.

The cubic display structures employed by Hamilton have as much interest as the exhibits themselves. Hamilton commented that:

'Growth and Form seemed an ideal subject for another involvement of that time, exhibition design. By the turn of the century the 'exhibition' was beginning to be understood as a form in its own right with unique properties. My meeting with Roland Penrose was propitious because he commended the idea of an exhibition on Growth and Form to the Institute of Contemporary Arts. The result was that a good deal of time spent at the Slade was devoted to finding the financial resources, researching, designing and, in part, making the exhibition which was to be the ICA's contribution to the Festival of Britain in 1951.'[190]

The exhibition as a creative undertaking was, as Hamilton noted, a twentieth century notion. Hamilton's use of geometric frameworks emphasised both his interest in the mathematics of form and also the related issue of repetitions and groupings. It is notable that here the white cubic geometries which so dominate display aesthetics in contemporary art have a clear subtext of reason and order. His grid-structures were both constructions of cells and single forms, networks of repeated shapes, and also hint at the measured proportions of natural structures within Thompson's book. The publicity material for the exhibition (see Figure 25, overleaf) is based around a Cartesian grid too, the visuals and text displayed in an off-centre arrangement. The images include cells, crystals and the beautiful hexagonal skeletal structure of the radiolaria, as discussed by Thompson himself at length.

[190] Hamilton. *Op. Cit.* (1982) p. 10

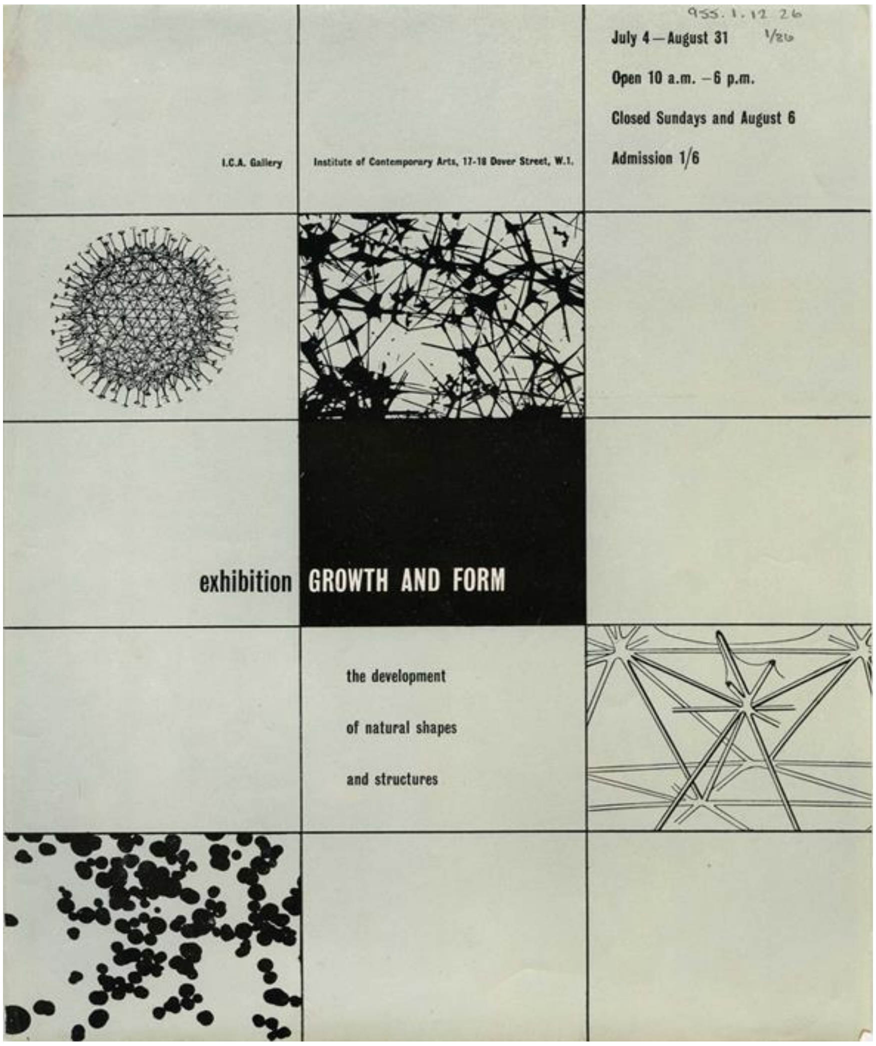


Figure 25: *Publicity Material from the On Growth and Form exhibition* (1951)
Tate Gallery ICA Archive. Ref. TGA. 955/1/12/26

Geometry in display is thus simultaneously the display of an ideology of form. Thompson wrote that scientists needed to pursue 'the ephemeral and accidental, not eternal nor universal things' in order to gain sophisticated understanding of the physical world.[191] This is a striking echo of Charles Baudelaire's famous call that artists should capture modernity:

[191] Thompson. *Op Cit.* (1917) p. 6

‘By ‘modernity’ I mean the ephemeral, the fugitive, the contingent, the half of art whose other half is the eternal and immutable…’[192]

This is an interesting parallel between modernity in art and modernity in science, representing as it does the same collision of an established value system based on a teleology with the scrutiny of nature (and humanity) as it unfolds around us. For Thompson, natural forms are thus growing, evolving structures, linked into a web of potential influences and outcomes. Thompson’s biology treated the organism as part of an extended environment, another indication of his affinity with systems thinking. One could also argue that the growing interest in the contexts of display and interpretation on the part of artists such as Hamilton and Pasmore is essentially a systems approach, drawing in as they did not only the abstract work of art but its environment, its audiences and its relationship with other disciplines.

The same qualities of biological mapping came across in the Analytical Drawing exercises created at Leeds, and those run by Victor Pasmore at Durham. Figure 26, overleaf, is an exercise by a student of Tom Hudson’s at Leeds, in which the crumpled form of a paint tube is analysed. While this series of drawings lacks the sharply geometric definition of those created under Hamilton, it still demonstrates the tendency to measure and articulate form and structure. The exercise title of *Analysis of Structure in Apparent Informality* is telling in its own right; a paint tube must be crushed and crumpled in order to fulfil its design and the cumulative crushing of its surface is achieved by a regular squeezing action. Thus the resulting pattern of creases and folds is a measurable map of physical processes:

[192] Baudelaire, C. (1863) “The Painter of Modern Life”. In: Baudelaire, C. (1964) *The Painter of Modern Life and other Essays.* Phaidon. London. p. 13.

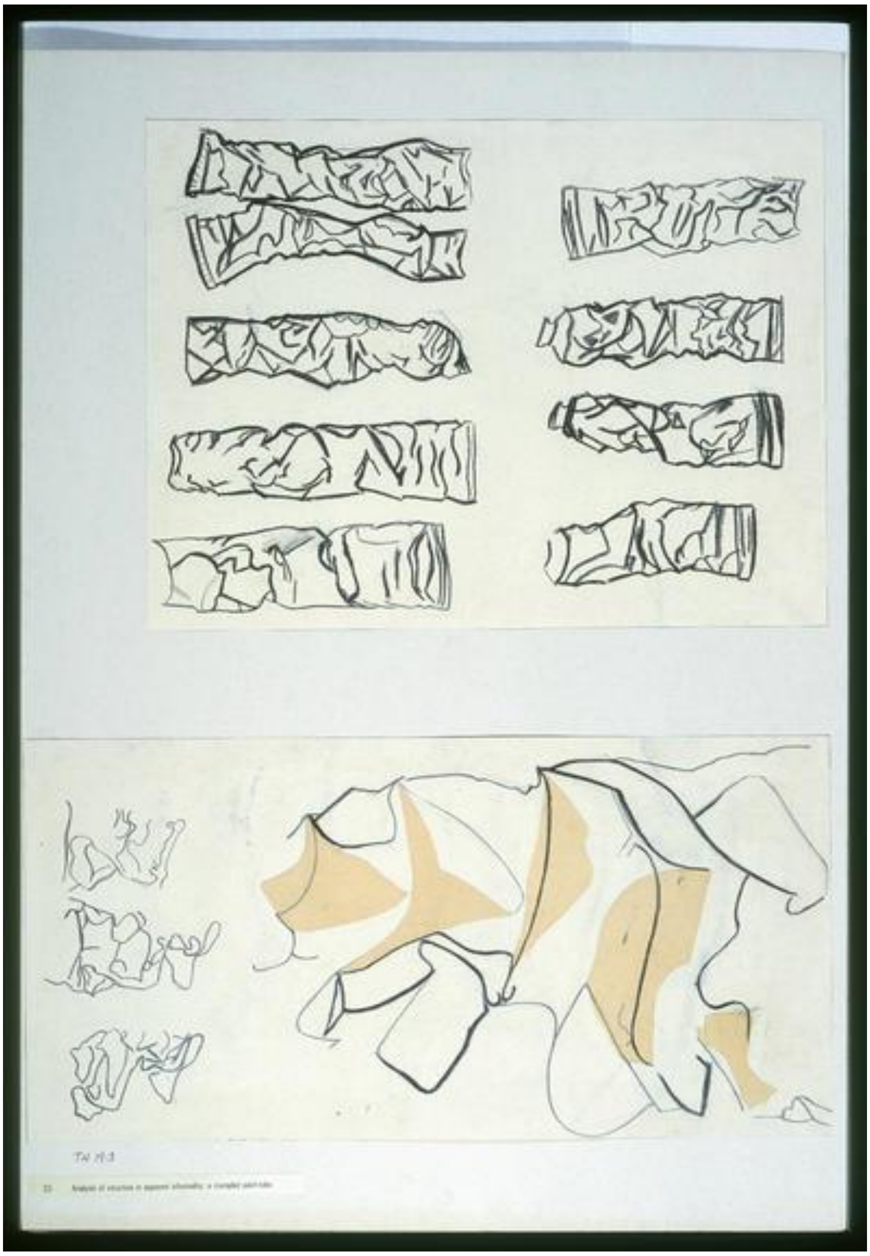


Figure 26: Anon: Student of Tom Hudson. (1965) *Analysis of Structure in Apparent Informality: A Crumpled Paint-Tube.* Leeds College of Art. NAEA.

Underlying Hudson's exercise is the same empiricism, the same focus on form as a result of process, which D'Arcy Wentworth Thompson presented in *On Growth and Form,* here applied to a man-made object.[193] This exercise also recalls William Johnstone, who wrote that a student should crush a ball of clay in his hands and then

193 Thompson. *Op Cit.* (1917)

examine the resulting mass in order to understand the mechanics of the human hand.[194] This mechanical analysis was equally apparent in exercises pertaining to natural form and to colour (see Figures 27 and 28, below and overleaf). These annotated colour studies float on the page. The interaction of colour can just as effectively be explored within the context of a larger design or project: this analytical focus on a series of interactions and effects demonstrates the same mechanised view of creative practice:

Figure 27: Watterson, A. (student of Tom Hudson). (1960) *Colour Analysis of a Flower*. Leeds College of Art. NAEA.

[194] *Op Cit.* (1980)

While Figure 28, below, is a series of studies from plant forms, the resulting line drawings focusing on structure and pattern. Each study is a fragment on the page, extracted from the larger plant form which is not represented as whole:

Figure 28: Anon: Student of Tom Hudson. (1960) *Analytical Drawings using Charcoal and Ink.* Leeds College of Art. NAEA.

Students of both art and design mapped out these fragmentary details in order to extract pattern and form for the purposes of abstraction. Large forms and complex wholes can be abstracted just as well as details, but this essential breaking down of the whole, this mapping out, was a process which gave Basic Design its distinctive character. Like pinned specimens, each small study of form, colour or structure is laid out in a manner which resists being read as a whole. This was essential to the concept of a ‘visual grammar’; the extraction - and abstraction - of components which could be reassembled by the artist in an adaptable new age.

vi) Pasmore, Hamilton and *On Growth and Form*

For the Festival of Britain in 1951, Pasmore was commissioned to produce a mural, painted onto ceramic tiles on the south-east wall of the Regatta Restaurant (now demolished). Figure 29, below, shows Pasmore working on his design, entitled *The Waterfall.*

Figure 29: Victor Pasmore. (1951) *Preparation for the Waterfall Mural.* The Festival of Britain. Telegraph Newspaper archive.

That year, Pasmore and Hamilton had engaged in debate at the opening of *On Growth and Form,* concerning the spiral structure:

'Hamilton: Does a concept ever suggest a painting?

Pasmore: Yes, the concept of a spiral could start a picture.

Hamilton: it means no more to you than that?

Pasmore: No. (he then left the meeting).' [195]

This exchange was part of a discussion on method between the two artists, Hamilton favouring a rationalist, pre-planned approach, Pasmore believing himself to be an empiricist. The archived notes from the public view of *On Growth and Form* suggest a slight antagonism, recording Pasmore's abrupt exit. The form in question, that of the spiral, was an essential element of *On Growth and Form,* and thus of this exhibition. In the mural completed that same year, we can see that the rhythmic painted lines extending across the wall space emanated from a spiral form, like a vortex.

Pasmore painted intuitively whereas given the same exercise, Hamilton professed he would have a planned outcome before he started to paint. Figure 30, overleaf, is Hamilton's *Chromatic Spiral,* which he included in the *On Growth and Form* exhibition that year and it illustrates the rational approach Hamilton favoured, each point of growth on the spiral plotted out, and each point systematically gaining another line to represent the cumulative increase he was exploring. Hamilton's painting was an effort to explore the visual effects of a growth concept. Pasmore on the other hand, took the spiral form to be the start of a more intuitive process, dependent on the artist's will.

[195] Transcript of Public View of *On Growth and Form.* No. 1. 9 January 1951. ICA Archives. pp. 10-11

Figure 30: Richard Hamilton (1950) *Chromatic Spiral.* 543mm x 485mm.
Tate Collection.

While Pasmore's approach to the natural world differed from Hamilton's, he was still engaged in debate about the artist's relationship to organic form. Prior to his induction into abstraction at the Central School, he had been a long-time admirer of Cezanne, whose own methodical approach to the geometries of nature can certainly be detected in Pasmore's practice. However, some of the most telling insights into Pasmore's views on nature appear within an exchange of letters with Charles Biederman in the 1950s. Richard Yeomans addressed Pasmore's discussions with Biederman at some length in his PhD thesis, particularly in relation to Pasmore's love of Cezanne.[196] For the purposes of this case study, I will be looking solely at how this exchange reflected Pasmore's engagement with the natural and mechanical worlds, with a specific focus on how this translated into Pasmore's philosophy of education. Biederman asked Pasmore the following questions of Pasmore on July 17 1955:

'(1) If the old content is obsolete, is this also true or not of the means which have always been employed for communicating that content, namely the mediums of painting and sculpture?

(2) If the artist no longer abstracts from the appearances of nature and instead creates or invents his art content which "operates like nature," then is it true or not that he must nevertheless learn to abstract from the operations of nature?' [197]

The second question is the most significant, and it is a response to Pasmore's article 'The Artist Speaks', in which he explored the issue of whether artists abstract from the appearance of nature or operate 'like nature'.[198] To learn to 'abstract from the operations of nature' would be to scrutinise not only form but process, in line with Thompson's treatise and responding to Pasmore's own suggestion that:

'What I have done is not the process of abstraction from nature, but a method of constructing from within.'[199]

And later:

---

[196] Yeomans. *Op Cit.* (1987) pp. 110-132
[197] Grieve, A. (1982) "Charles Biederman and the English Constructionists I: Biederman and Victor Pasmore". *The Burlington Magazine*, Vol. 124, No. 954, (Sep., 1982), pp. 540-551. p. 545
[198] Pasmore, V. "The Artist Speaks". *Art News and Review.* Vol.III, 2. 24th February 1951. p.3.
[199] *Ibid.* p. 3

‘When this takes place, I proceed to select and, by organisation and analogy, unite what I have done in a single form ... that ancient maxim, 'art imitates nature', must no longer be construed in the superficial sense which the schools and the academies have imposed on us, but in its deeper meaning - art imitates nature in the manner of her operation ...’[200]

For Pasmore, abstraction was process-based, a kind of growth structure in its own right. In the same article, Pasmore discussed the spiral, the same form which he had debated with Hamilton the month before:

The spiral movement which can be discerned throughout nature, in many different forms, is reduced to its single common denomination - the simple spiral. Similarly other characteristic shapes are signified in the same way; so we get the rectangle, the triangle, the circle and other formal elements.’[201]

While this is strongly reminiscent of Cezanne’s famous maxim ‘treat nature by the cylinder, the sphere, the cone...’, Pasmore’s argued that the process of drawing a spiral will evoke the same emotions as the spiral does when seen in nature.[202] His focus on the creative process as an intuitive kind of growth that was parallel to that of nature was divergent from Hamilton, who saw the same concepts of growth as rational issues which the visual arts could explore. We can take these two approaches at indicative of the two strains of Basic Design taught at Leeds; one rational, analytical and formal, the other intuitive, aesthetically-judged and open. However, underlying Pasmore’s intuitive organicism is a systems awareness. In arguing against what he believed was a confusing definition of so-called ‘structural processes’ within Biederman’s letter, he wrote:

[200] *Ibid.* p. 3
[201] *Ibid.* p. 3
[202] Gasquet, J. (1991) *Cézanne, - a Memoir with Conversations.* Thames and Hudson. London. pp. 163-164

'...the mind is capable of projection as well as reflection. This means that the artist is a creative as well as an imitative being. He is not compelled to copy nature because he himself is a process of nature containing the very same elements which he sets out to copy. In other words he can produce the likeness of nature out of himself. His mind is conditioned as much by its own structural process as by the processes imposed on it from the outside; hence its power of projection.'[203]

Pasmore mentions the structural process of the mind, as well as outside forces; much as Thompson believed that natural forms must be understood in the context of the multifarious influences upon them; natural form as mechanism.

vii) The Mechanisation of Biological Form

On Growth and Form and the propositions Thompson offered about the mathematics of biological form proved to be an invaluable source of ideas for artists in the twentieth century. As noted above this included Richard Hamilton, for whom Thompson's text provided extensive inspiration, as well as an earlier generation of artists of the 1930s such as Ben Nicolson and Barbara Hepworth. The importance of biological form to British modernism (such as the influence of morphology, evolutionary transitions, organic form or process) is clear. However, while the relationship between *On Growth and Form* and British abstraction is well-documented, there is another layer to this relationship which has been neglected: this is the *mechanisation* of biological form and its subsequent influence on abstract art. Thompson writes:

'In Aristotle's parable, the house it there that men may live in it; but it is also there because the builders have laid one stone upon another. It is as a *mechanism*, or a mechanical construction, that the physicist looks upon the world, and Democritus, first of all physicists and one of the greatest of the Greeks, chose to refer all natural phenomena to mechanism and set the final cause aside.'[204]

[203] Grieve. *Op. Cit.* (1982) p. 546
[204] Thompson, D'Arcy Wentworth. (1917) *On Growth and Form.* Cambridge University Press. Cambridge. p.6.

In pursuing the factors (other than evolution) which dictate growth patterns and eventual structure in natural forms, Thompson necessarily treated biological form as mechanism. Thompson's position is as rooted in philosophy as it is in practice. As well as attempting to overcome biology's dominant focus on evolution in favour of a broader, mathematically oriented approach, he also makes the above point in opposition to the teleological problem for scientists - that of the world as God's creation. In this Aristotelian parable, even if the world was created for man it was also *built,* brick by brick. Thompson thus argues that biologists must look at process in order to understand the final form, rather than the underlying cause. Thus *mechanism* in this context is the processes and influences that contribute to the evolving structure of a living form. This in itself is in contrast to the methodological reductionism which had dominated the sciences for the previous two centuries, based on giving research problems or areas fixed and defined boundaries. The cost of this is the exclusion of elements which influence each other, within the complex interactions of systems of knowledge.

To an extent then, Thompson's argument within *On Growth and Form* anticipated the systems theories that were to emerge in the interwar period. This is for the simple reason that if the study of biological growth is opened out to mechanical reasoning, then by extension all processes and influences upon that living form must be examined, creating a network or system around the living form. For example, plant growth and its evolving form involves variables such as climate, weather condition, soil, disease and proximity of other plants. Where the reductionist might exclude variables to create boundaries, the mechanical biologist would pursue them. Thompson gives the example of an amoeba as a 'so-called simple organism', stating some of the forces at work and then commenting that:

'Like other fluid bodies, its surface, whatsoever other substance – gas, liquid or solid – it be in contact with, and in varying degree according to the nature of that adjacent substance, is the seat of molecular force exhibiting itself as surface-tension, from the action of which many important consequences follow, greatly affecting the form of the fluid surface.'[205]

If we were to map the mechanics of a simple organism in terms of forces upon it, what would result would be a connective network of elements; gases, liquids, and solid forms which contribute to its processes, thus extending far beyond the reductive boundaries of traditional morphological analysis. The extent to which the reductionist tradition had dominated science must be emphasised here – in the natural sciences, all living creatures had been treated as closed systems by scientists for the purposes of 'demarcation'. To illustrate, Figure 31, below, shows an (inaccurate) illustration by an unknown artist of the 'Duck of Vaucanson' or *The Digesting Duck*, an automaton which gave the illusion of eating and excreting, by eighteenth-century inventor Jacques de Vaucanson:

[205] Thompson. *Op. Cit.* (1917) p. 17

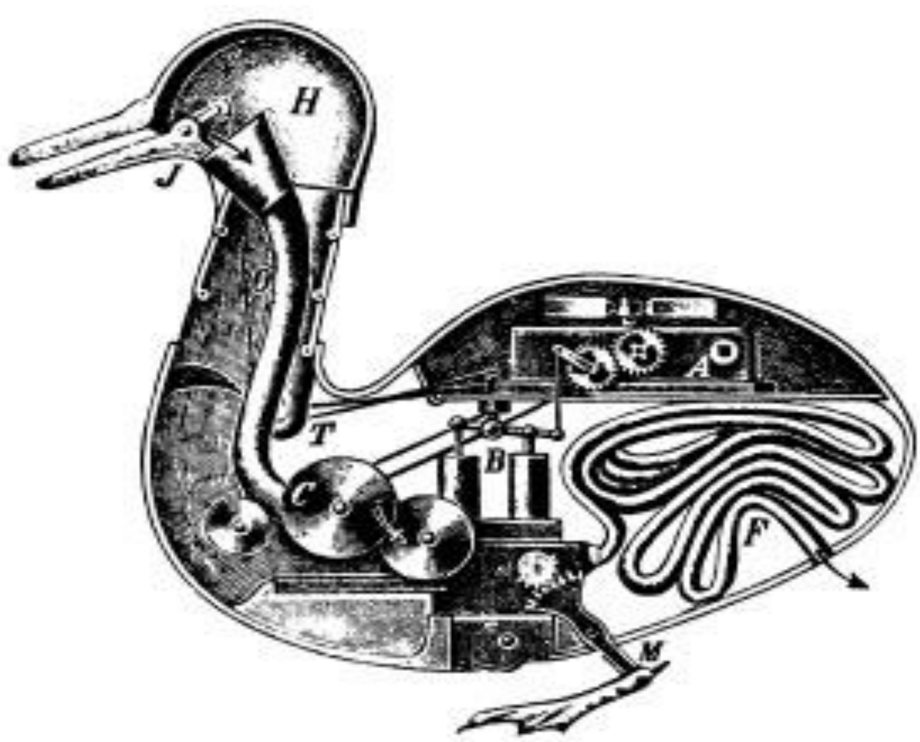


Figure 31: Anon. (1738) *A Postulated Interior of the Duck of Vaucanson.*

The illustration shows the duck as a closed system, and is often cited as an illustration of, or cultural response to, Descartes' *de Homine,* in which he argues that all non-human animals can be reductively consisted to be automata:

'I assume their body to be but a statue, an earthen machine formed intentionally by God to be as much as possible like us. Thus not only does He give it externally the shapes and colour of all the parts of our bodies; He also places inside it all the pieces required to make it walk, eat, breathe.'[206]

Mechanistic rather than mechanical, Descartes' proof of non-human life as automata is based on the internal body as a closed system. The automaton itself (see Figure 32, overleaf) was destroyed in 1879, and this photograph shows the elaborate and enormous construction that supported the simple mechanisms of taking in corn and

[206] Descartes, R. (1971) *Treatise of Man.* Trans. Thomas Steele Hall. Ed. Bernard I. Cohen et al, Harvard University Press. Cambridge. pp. 104

releasing, from a separate compartment, crushed corn from its rubber intestines.[207] This semi-naturalistic approach to the interior of automata was part of a wider late eighteenth-century fashion, echoing the prevalent trend in the natural sciences of explaining (and reducing) natural phenomena to mechanical process. The representation of living form as closed system is in direct opposition to Thompson's amoeba which he describes as an open system of external influences and forces. In an article examining the philosophical implications of Vaucanson's duck, Jessica Riskin writes:

> 'At each successive moment, the competing beliefs that life is mechanism and that life is nonmechanism have engaged with scientific, technological, social, and cultural developments to produce continually changing hypotheses about the line dividing life from nonlife.'[208]

This philosophical struggle is embedded in the critical discourse around network theories in the twentieth and twenty-first centuries too, and it is underpinned by the anxiety of the machine which is made more acute by automata, or artificial life. Despite this unease, it should not be forgotten that machines are constructed by the human hand based on knowledge gathered from the observation of natural phenomena. They harness the same powers of energy, force and motion by which every process in the living world is completed.

---

[207] Riskin, J. (2003) "The Defecating Duck, or the Ambitious Origins of Artificial Life". *Critical Inquiry*. Vol. 29, No. 4, Summer 2003. pp. 599-633
[208] *Ibid.* p. 612

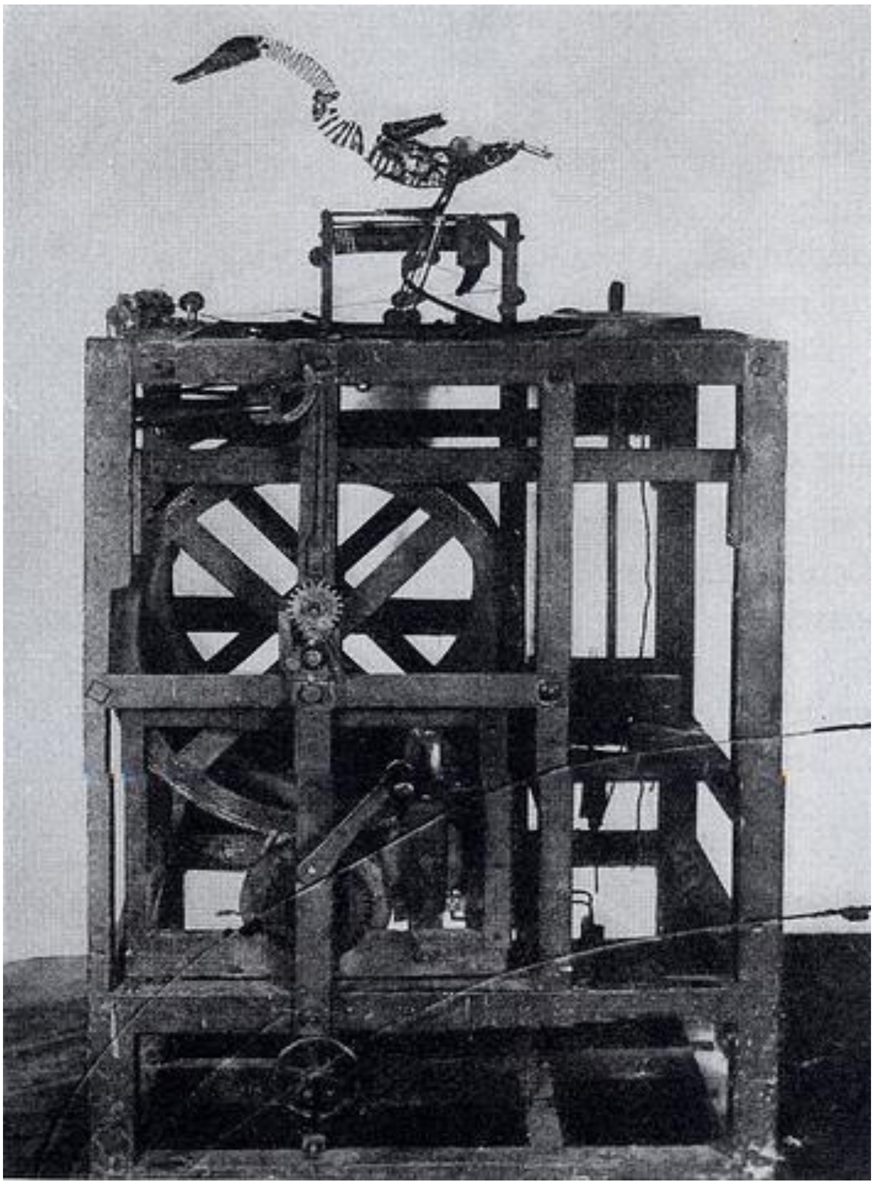


Figure 32: Jacques de Vaucanson. (1739) *Digesting Duck.* Destroyed 1879.

Of pre-twentieth century biological science, Giedion wrote that:

'…in biology, the animate being was considered simply as a sum of its parts, assembled like those of a machine. Organic processes were regarded as purely physico-chemical in nature, as if an organism were a kind of chemical plant.'[209]

He saw the twentieth century – more specifically the interwar period – as the moment of completion for the process of mechanisation, and thus the period in which other

[209] Giedion. *Op. Cit.* (1948) p. 718

disciplines, including biology changed their practices due to understanding mechanised interconnectivity.[210] The essential work by the biologist of analysing physical forces upon form, in turn relies upon the most important factor in Thompson's vision: the Platonic notion of ideal numbers. Stephen Jay Gould writes:

> 'I) His view of Plato and Pythagoras (mathematics, generality and deduction) versus Aristotle (description and induction). 2) His Greek commitment to a pure and abstract understanding of form versus his Baconian idea that knowledge is power, as expressed by the engineer's love for a good design because it works.'[211]

In his 1971 article in *New Literary History,* Gould explores the philosophical construction of Thompson's vision, and its continuing relevance and influence in the twentieth century. Above, he outlines the theoretical basis for *On Growth and Form,* a synthesis of classical mathematics and contemporary methodology. Thompson argues that the pure mathematics that is so essential to the physical sciences is essential also to the natural sciences, citing Bichat, Pascal and Schwann.[212] The language of mathematics is thus a unifying element across the sciences, and in emphasising this Thompson once again draws similar systems to be found within traditionally distinct areas of scientific research.

I make this point not because there is an established trajectory of ideas between D'Arcy Wentworth Thompson and the later systems theorists, but rather because there is a fundamental philosophical shift here which underpins both. This is the move away from reductionism towards a scientific practice which interrogates the complex

[210] Giedion. *Op. Cit.* (1948) p. 41
[211] Gould, S. J. (1971) "D'Arcy Thompson and the Science of Form". *New Literary History.* Vol. 2., No. 2. Form and its Alternatives. Winter, 1971. pp. 229-258. p. 10
[212] Thompson. *Op. Cit.* (1917) pp. 11-12

relationship of influences around any given object of study. Ludwig von Bertalanffy wrote that:

‘So far the unification of science has been seen in the reduction of all science to physics, the final resolution of all sciences to physical events.’[213]

This is certainly true of Thompson and *On Growth and Form,* in that he wanted to:

‘…correlate with mathematical statement and physical law certain of the simpler outward phenomena of organic growth and structure or form…’[214]

That these laws also dictated the outcomes of human endeavours such as architecture and engineering was also clear to Thompson. This is best evidenced by the parallels Thompson formed between engineering and biological structure in his chapter *On Form and Mechanical Efficiency*; in which he compares the engineering of bridges to bone structure, and recounts an anecdote about the engineer Professor Culmann, who upon visiting the dissecting room of his colleague Meyers and viewing a section of bone, reputedly cried out ‘That’s my crane!’.[215] Figure 33, below, shows an illustration provided by Thompson:

[213] Von Bertalanffy, L. (1969) *General System Theory: Foundations, Development, Applications.* George Braziller. New York. p. 48
[214] Thompson. *Op. Cit.* (1917) p. 9
[215] Thompson. *Op. Cit.* (1917) p. 232

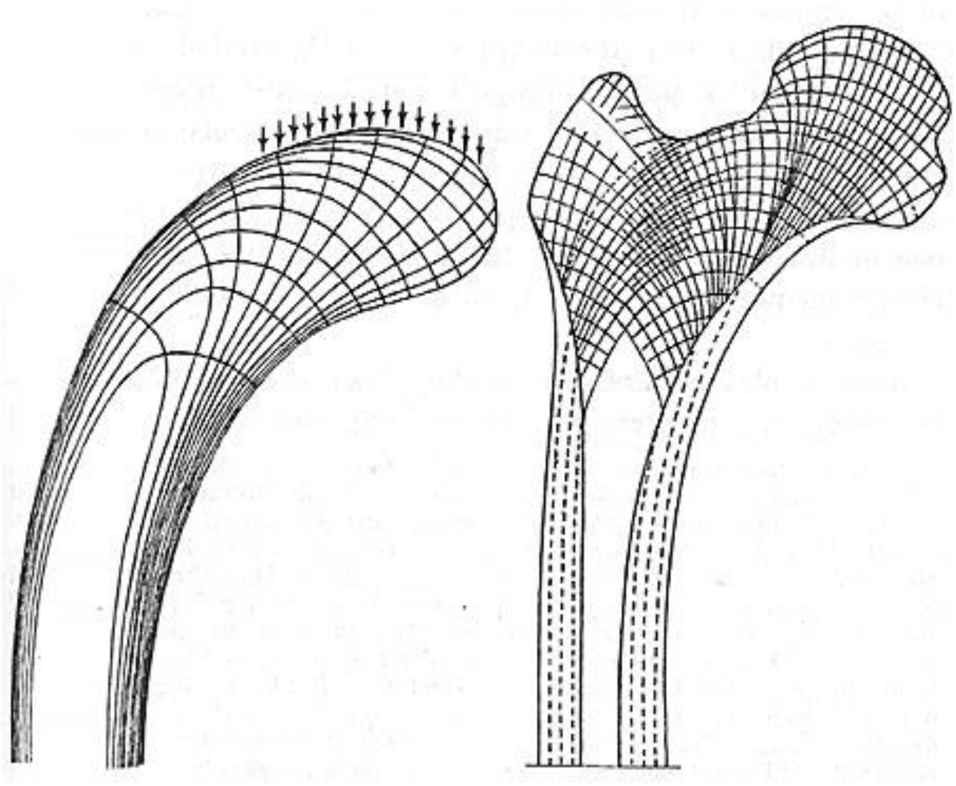


Figure 33: Crane-Head and Femur (After Culmann and J. Woolf).
From D'Arcy Wentworth Thompson. *On Growth and Form.* 1917 p. 233

Thompson explains:

'…we have no difficulty in seeing that the anatomical arrangement of the trabeculae follows precisely the mechanical distribution of compressive and tensile stress or, in other words, accords perfectly with the theoretical stress-diagram of the crane.'[216]

The same physical laws underlie both mechanisms, organic and man-made, as both fulfil the same purpose of distributing stress while maintaining form. The manmade world is not set apart from these physical laws: every known form, manmade or otherwise, is formed by function and environment. Any mechanism is, quite simply, a system.

[216] Thompson. *Op. Cit.* (1917) pp. 233-234

viii) Aspects of Form and Systems

During *On Growth and Form,* the ICA held a symposium called ‘Aspects of Form’. A book of essays was published under the same name to coincide with the exhibition, and it is extraordinary in the extent to which it suggested early systems thinking. Herbert Read wrote in the preface that:

‘The increasing significance given to *form* or *pattern* in various branches of science has suggested the possibility of a certain parallelism, if not identity, in the structures of natural phenomena and of authentic works of art.’[217]

The book was edited by Lancelot Law Whyte, who believed that there were common patterns exhibited across disciplines which needed to be explored. While Read commented on the possible parallels between the formal qualities of modern art and those in the natural world, Whyte gave an even more ambitious suggestion in his introduction to the book:

‘Common to the ideas of form, configuration, pattern, and structure, is the notion of an ordered complexity, a multiplicity which is governed by some unifying principle. Our theme is thus the *realisation of unity of spatial form in the complex processes of physics, biology, psychology, and art.’*[218]

Whyte defines the book as a pursuit of form as clearly set in space, so for his purposes he excludes ‘musical form, linguistic form, abstract mathematical form, and the forms of thought, of human personality, and of society’.[219] However, by identifying these alongside physics, biology, psychology and art, Whyte demonstrates a connective or systems approach in line with that which von Bertalanffy would formalise and legitimate. He excluded only those formal structures which could not in his opinion be analysed visually. This emphasis on parallelism also echoes Giedion’s multi-faceted

[217] Read, H. "Preface to 1951 Edition: Whyte, L. L. *Aspects of Form.* p. xxi
[218] *Ibid.* p. 2
[219] *Ibid.* (1951) p. 2

exploration of mechanics in the modern world, seeking similar concepts across traditionally separate fields. Whyte's phrase 'an ordered complexity' is expressive of the balance between pattern and chance which dictates form in the natural world. In a 1951 review of the book, crystallographer Kathleen Lonsdale stated that:

'Those who seek a unitary principle which correlates all observations and experiences within the range of human perception and understanding will welcome this volume, which is a general survey of visual form, from physics through biology and psychology to art.'[220]

The subjects of chapters within *Aspects of Form* included modern embryology, gestalt perception, activity patterns in the brain, biochemical aspects of form and Rudolph Arnheim's famous contribution on 'Gestalt Psychology and Artistic Form'. Its parallel presentation of formal growth and development across disciplines was an indicator that within the world of contemporary art, a new modus operandi was developing. Both the formal qualities of abstraction and the thematic content of works of art were networked with parallel developments in the sciences. In the chapter "Biochemical Aspects of Form and Growth", Joseph Needham wrote that:

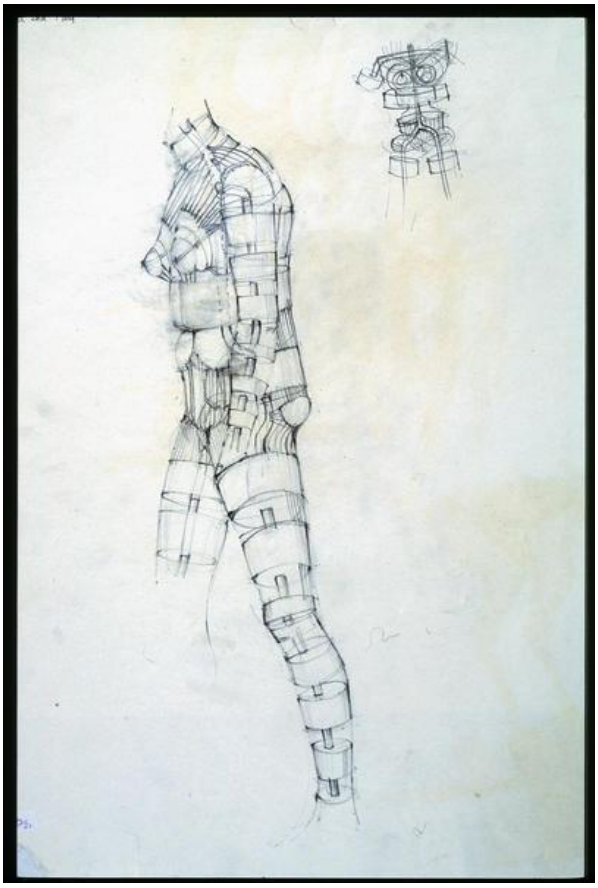
'A unified science of life must inevitably seek to know how one level is connected with others. For the body contains organs, the cells nuclei and mitochondria, these structures are built up of colloidal particles which in turn consist of molecules large and small (proteins, carbohydrates, fats, steroids, etc.), within which again are the atoms with their different kinds of valences and bonds.'[221]

Between the unitary levels of organisms, there are vital connections of exchange – and for Whyte this connective network also includes aspects of culture, society and economy. This unique collection of essays offers an insight into the creative culture out of which Basic Design grew: a culture of interdisciplinary parallels, analytical practice and gestalt form, of mechanism, structure and connectivity.

---

[220] Lonsdale, Kathleen. (1953) "Aspects of Form" (book review) *Acto Crystallographica*. P. 224
[221] Whyte. *Op Cit.* Needham, J. (1951) p. 79

1.4. Biology, War and the Thinking Machine in Basic Design Pedagogy



Unknown student of Richard Hamilton *Form (Image and Anatomy)*
1965, King’s College University of Durham. NAEA.

‘The most complex organic pattern known is the nervous system of man, containing something of the order of ten thousand million nerve cells. Many of these cells and their processes, the nerve fibres, are arranged in intricate three-dimensional patterns, related to the receptors and effectors of the body, but a proportion of them have little apparent fixed organisation. Around the stem and branches and foliage of the nerve-tree is draped a diffusely-connected network.’

W. Grey Walter, *Aspects of Form*

i) Systems and WWII

The systems theories of the interwar years influenced not only the development of weaponry but also logistics and communication.[222] These systems theories had emerged in the biological sciences before World War II, offering both a new philosophy of the mechanics of nature and a new approach to understanding any given biological form within the extended systems which influence its growth and survival. This same theoretical approach underpinned the developments in weaponry and the logistics of warfare during World War II, marking a new phase in technological development. Underlying the new technologies were a series of principles derived from systems theory:

- Every system, biological, mechanical or social, has common characteristics
- To understand systems we must understand the extended environment within which any given system operates
- Science must counterbalance reductivism with systems awareness

These simple points were vital to the new generation of weapons which were employed during the war. For example, a pilot in a plane equipped with radar technology had to process a rapid flow of moving images as he made sense of the ground below him. The map of dark and light forms transmitted by the radar simplified the mass of visual information he received as the plane moved above the landscape. Man and machine

[222] General System Theory made an instrumental contribution to logistics and weapon design during WWII and after the war there was a spate of publications dealing with systems identification and behaviour. This included Ludwig von Bertalanffy's 1969 publication: *General System Theory: Foundation, Development, Applications.* George Braziller. New York.
[222] Descartes, R. (1971) *Treatise of Man.* Trans. Thomas Steele Hall. Ed. Bernard I. Cohen et al, Harvard University Press. Cambridge.

became one, as part of an extended system which took in the plane, the pilot and their immediate environment.

This moment of fusion between technology, the natural world and man marked the start of the network age. The successful utilisation of General System Theory in the war changed the philosophy of science from the Aristotelian reductivist approach which had dominated for centuries to a more integrated, complex view of the nature of human understanding.[223] It was through the systemic technologies of World War II that General System Theory became practice, seeing in a period of interface for technology and the natural sciences. What had previously only existed as a philosophical position - the Cartesian argument of living form as mechanical system – became a technological reality.[224] Man entered into a complex interface with machines and this was made possible by the vital role of the physical sciences within mechanical engineering. The pilot, his plane and his extended environment were all relevant to the design of new technologies. In the post-war development of the cybernetic movement, the mechanisation of biology was taken to a new level in the investigation of the processes of human brain and body as machines or computers.

Thus World War II changed mankind's relationship with machines forever, its new technologies achieving unprecedented levels of responsiveness and interaction. The rapid developments in weapons and technology which took place during the war

[223] *Ibid.* (1969)
[224] Descartes, R. (1971) *Treatise of Man.* Trans. Thomas Steele Hall. Ed. Bernard I. Cohen et al, Harvard University Press. Cambridge.

resulted in a new kind of warfare, as Churchill famously recalled in his account of the war:

‘This was a secret war, whose battles were lost or won unknown to the public; and only with difficulty is it comprehended, even now, by those outside the small high scientific circles concerned. No such warfare had ever been waged by mortal men.’[225]

Recalling here the war enacted behind the doors of laboratories and meeting rooms, Churchill emphasised the complexities of warfare which was fought and won upon the vanguard of scientific discovery. As a result, one of the key philosophical questions of the post-war years was that of how humanity must adapt in the age of the machine. Martin Heidegger wrote:

‘Likewise, the essence of technology is by no means anything technological. Thus we shall never experience our relationship to the essence of technology so long as we merely represent and pursue the technological, put up with it, or evade it. Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral….’[226]

In *The Question Concerning Technology,* published in 1951, Martin Heidegger confronted the phenomenological problems created by the increasingly prominent place of technology in post-war society, arguing that it is primarily a job for the arts to be the tool we use to understand technology as it unfolds before us. He argues that the root of the word technology is *techné,* bringing forth what is true and beautiful through poetics. Technology is in principle the *systematic* treatment of an art, craft or technique. Its contemporary usage can be dated to the very period in which Heidegger was writing, when research in the physical sciences led to the increasingly sophisticated machine technologies of the age. Our contemporary understanding of

[225] Churchill, W. (1949) “The Wizard War”. *The Second World War Volume II.* Haughton Mifflin Company. New York. p. 337

[226] Heidegger, M. (1964) "The Question Concerning Technology", from Martin Heidegger: *Basic Writings from "Being and Time" (1927) to "The Task of Thinking" (1964*), rev. ed., edited by David Farrell Krell. Harper: San Francisco.

technology is that of machines and devices rather than systems – although a machine itself is by nature an organising system.

Heidegger's issue of 'unfolding' technologies holds within it an insight into what occurred in the late twentieth century – swift technological advancement that increased in speed and complexity in an endless unfolding before our eyes. This notion that technology could somehow escape human control and become a self-developing entity if we are not watchful comes across too, as Heidegger comments that:

> "The will to mastery becomes all the more urgent the more technology threatens to slip from human control. But suppose now that technology were no mere means, how would it stand with the will to master it?"[227]

Taken in a post-war context, this fear of self-regulating technology is a pertinent one. World War II was fought and won with computerised weaponry, weapons which were systems in themselves. While Heidegger argued for a more anthropological understanding of technology as an extension of human needs and desires, it is also clear that the introduction of computerised machines opened up a new kind of vulnerability which was beyond human violence.

An interesting parallel to Heidegger's anxious treatise can be found in Norbert Wiener's *The Human Use of Human Beings,* first published in 1950 and revised in 1954. Wiener was an early thinker in the development of cybernetics, and his writing has clear relevance to the technologies of World War II:

[227] *Ibid.* p. 2

'…Society can only be understood through a study of the messages and the communication facilities which belong to it; and that in the future development of these messages and communication facilities, messages between man and machines, between machines and man, and between machine and machine, are destined to play an ever-increasing part.'[228]

Wiener had a direct influence on the artists of the Independent Group, notably Lawrence Alloway and Eduardo Paolozzi.[229] He explored the potential and problematics for a future society faced with the likelihood of increasingly advanced automata. In a somewhat Utopian vision, Wiener suggests that a society where the work was done by machines might allow humanity the freedom to pursue knowledge and the arts. However, the 'messages between man and machine' in the wake of the war included the anxious development of radar technologies and computerised weapons. An aircraft radar such as those developed at E.M.I in the war years could scan the ground and present the pilot with a rudimentary map of landmasses, sea and populated areas. It could indicate points where a weapon should be dropped.

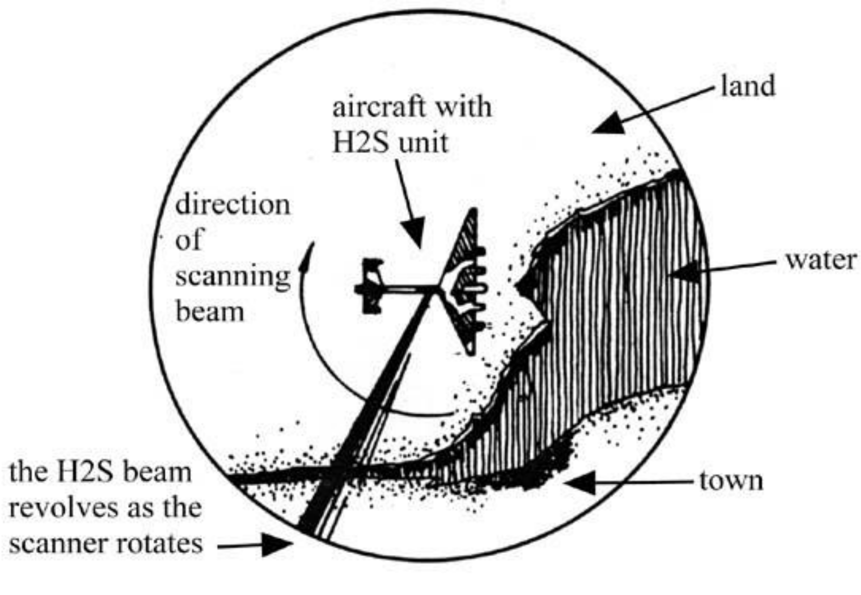


Figure 34: Anon. *Diagram illustrating H2S Radar Ground Mapping.* (H2S designed at E.M.I by Alan Blumlein, 1943)

[228] Wiener, N. (1988) [1950]. *The Human Use of Human Beings.* Da Capo. P. 16
[229] Stryker, E. M. *Op Cit.* (2011)

Figure 34, above, illustrates this notion. The H2S unit was designed at EMI in 1943, shortly before its inventor was killed suddenly in a test flight accident. Significantly, in the following years and until the end of the war, Richard Hamilton worked as an engineering draftsman for this company in a period of radar and missile development based on analogue computers. The development of 'thinking' machines was thus accelerated by warfare, their early uses limited to warfare. The important outcome of these developments in the post-war years can be summarised as a new technological issue: that of *communication* between man and machine. If a machine was capable of communicating complex information then technology had entered a new age of two-way interaction where the communication between man and machine might lead to varied outcomes. Wiener, like Heidegger, wanted to explore the possible harm future technologies could do to society and to consider how we could maintain our primacy over machines.

In discussing the development of automata, Wiener suggested that the human being should be viewed as a 'pattern', an intricate form whose balance in maintained through molecular process, temperature and other factors. We need to understand the pattern in order to replicate it. Wiener here demonstrates the same kind of systems approach which William Ross Ashby also exhibited in the post-war years.[230] The last century saw the inception of system and network theories of increasing sophistication, which can be traced from the interwar development of system theories by von Bertalanffy and William Ross Ashby to the network and complexity theories of the last decades.[231]

[230] Ashby, W. R. (1947) and (1952) Ashby's work on cybernetics was fundamental to Roy Ascott's development of *Groundcourse* at Ealing College.
[231] See von Bertalanffy, L. (1969) and Ashby, W. R. (1947) and (1952)

The problem that the many, increasingly sophisticated system and network theories of the twentieth century confronted had the same philosophical root that Descartes has described three centuries earlier – when separate elements interact together they become a system with shared processes and outcomes. In 1969 von Bertalanffy wrote that:

‘...there exist models, principles, and laws that apply to generalised systems or their subclasses, irrespective of their particular kind, the nature of their component elements, and the relationships or "forces" between them. It seems legitimate to ask for a theory, not of systems of a more or less special kind, but of universal principles applying to systems in general.’ [232]

Von Bertalanffy’s goal was to theorise systemic behaviour in a way that would be helpful across disciplines, allowing us to work with systems to maximise productivity and output, to understand growth and development, to understand the ramifications of change within a complex network of interrelated elements. During the war, systems theory had contributed to logistics, to the movement of soldiers, food, weapons and water. As stated, there were simultaneous developments in analogue computing which led to radar and missile technologies and during the war Richard Hamilton worked as an engineering draftsman for Thorne EMI (then EMI) while the design and development of British radars and missiles took place.[233]

Technologically driven – and organised – warfare characterised the Second World War. The development of atomic weaponry and its cultural legacy are also evident in

[232] The primary System Theory examined within this thesis study is von Bertalanffy, L. (1969) *General System Theory: Foundation, Development, Applications.* George Braziller. New York.
[233] Hamilton was an employee of EMI 1942-45, the period immediately after their first patented missile designs. While many engineering drawings from the period are still classified for security reasons, it is still apparent that some Basic Design exercises have the same mechanical – and diagrammatic – quality.

strains of abstraction in Basic Design.[234] Moreover, the philosophical problem of the complex whole was never more relevant or emotive than when it came splitting what was then the smallest single known entity in the physical world. Thus General System Theory, analogue computing, Gestalt psychology, wartime logistics and atomic warfare were all linked by the problem of the complex whole.

ii) Gestalt and the Structured Whole in Basic Design Exercises

'But now the revelation that perception itself is essentially a pattern-selecting and pattern-making function (a Gestalt-formation); that pattern is inherent in the physical structure or in the functioning of the nervous system; that matter itself analyses into coherent patterns or arrangements of molecules; and the gradual realisation that all these patterns are effective and ontologically significant by virtue of an organisation of their parts which can only be characterised as *aesthetic* – all this development has brought works of art and natural phenomena on to an identical plane of enquiry.'[235]

So wrote Herbert Read in his preface to *Aspects of Form*, linking the pattern-seeking instinct of Gestalt to other systems characteristics in the natural world. This evolving focus on the complexities of perceptive understanding was part of a revival of interest in Gestalt psychology. In World War II, James Jerome Gibson had developed his new theories of perception, which in tandem with those of Rudolph Arnheim had a verifiable impact upon the Basic Design movement.[236] The underlying principle of the 'structured whole' and the organising (or systemic) principles of human perception

[234] Point exercises at Durham and Leeds explored flows of molecules.
[235] Whyte. *Op Cit.* Read, H. (1951) pp. xxi-xxii
[236] Hamilton's familiarity and interest in Gestalt predates Basic Design and was already evident when he curated *On Growth and Form* at the ICA in 1951. Arnheim contributed his essay "Gestalt Psychology and Artistic Form" to the symposium and book *Aspects of Form* that year. The wider absorption of Gestalt into Basic Design is clear in the 'perceptive' focus of multiple art and design exercises at Leeds and Durham.

were in opposition to the molecularism of predecessors such as Wilhelm Wundt and thus fit into the broader pattern of systemic thinking in the mid-twentieth century.[237]

The Basic Design movement incorporated several exercises which examined perceptive processes, with a notable inclusion of Gestalt concepts. James J. Gibson's best-known theory of Gestalt perception, *The Perception of the Visual World*, had an interesting and pertinent process of development.[238] During World War II, Gibson directed the U.S. Air Force Research Unit in Aviation Psychology. It was in this post that he developed his initial theories of perception as he worked with pilots who were tasked with landing their planes on an aircraft carrier. In addressing this problem, Gibson rejected the standing theory of vision as an interpretation by the brain of an image caught on the retina.[239] The issue was speed and motion: for the pilot, perception was dependent on a constant stream of information, not a static image. It was upon this basis that Gibson developed his theory of optic flow. This essentially networked vision in recognition of that very modern problem of processing fast motion and a rapidly changing environment.

Gibson's influential book was researched and written at Harvard after the war, when he and his wife were in receipt of a large grant from the US Air Force for this purpose. Thus this research in Gestalt perception arose from the interaction of man and

---

237 See Arnheim, R. (1954) and (1974), Gibson, J. J. [1950] (1974), Koffka, K. (1935), Wertheimer, M. (1945)

238 Gibson, J.J. (1950) *The Perception of the Visual World*. Houghton Mifflin. Boston.

239 Gombrich, E. H. (1989) "Review of James J. Gibson and the Psychology of Perception by Edward S. Reed". *New York Review of Books.* January 19th, 1989. pp.13-15

machine: a subject which Hamilton subsequently explored in his exhibition *Man, Machine and Motion* at the Hatton Gallery and the ICA in 1955.

The impact of this systematised psychology of visual perception upon the Basic Design movement was clearly apparent in the pedagogies of Hamilton, Pasmore, Thubron and Hudson. Gestalt explored the human tendency to form pattern, as well as approaching the single problem at the heart of any system – the composite parts which make up the structured whole and how to define the boundaries of any whole. The wholeness of form in our visual perception is dependent on our pattern-recognition tendencies; it is a human tendency to order information into meaningful structures. Students of Victor Pasmore created Gestalt images as part of the Basic Design classes known as Positive/Negative at King's College. These exercises used the balance of black and white to explore shape-forming in the visual field, with reference to the Danish Psychologist Edgar Rubin's early work such as the infamous image of two faces in profile forming a vase (Figure 35, below):

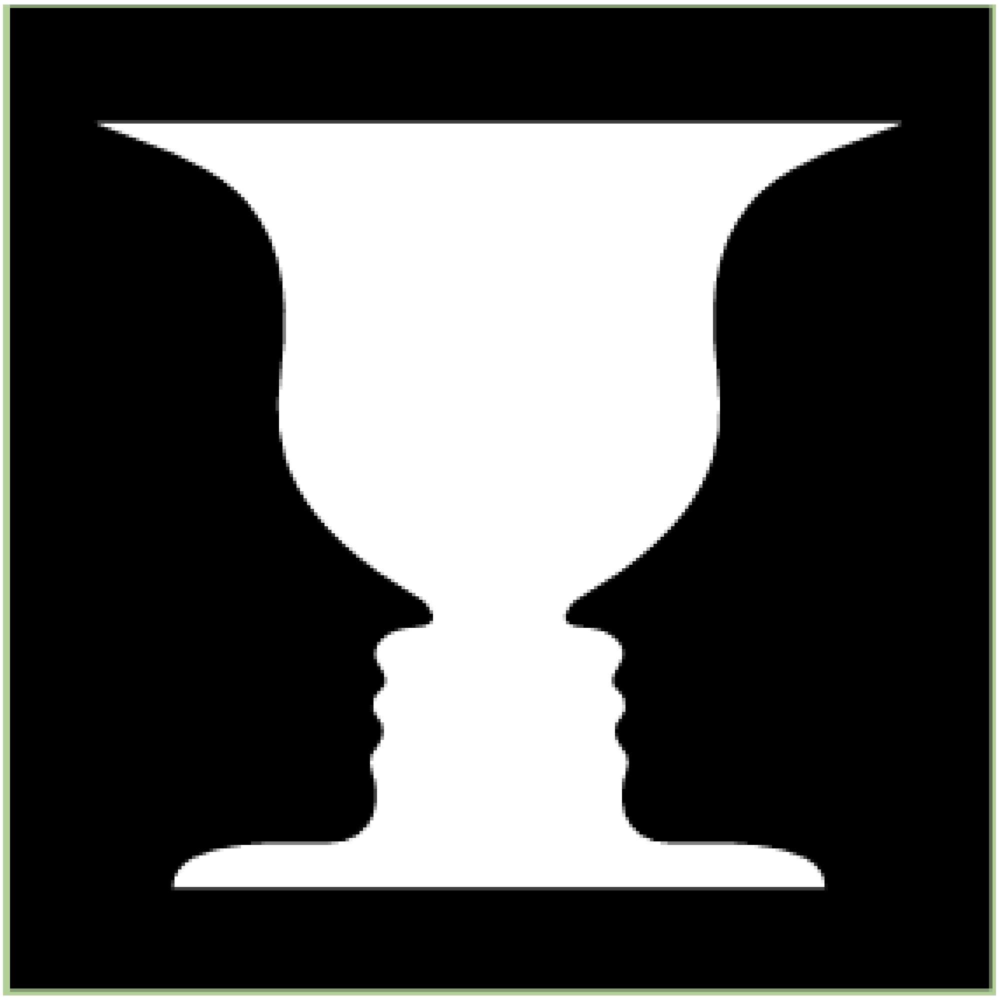


Figure 35. Anonymous. (1915) *After Rubins: Ambiguous Figure Ground.*

This simple trick of the eye is based on the Gestalt ordering principle, in that the brain organises pattern into meaningful form. Some Basic Design exercises incorporated a figurative conceit such as the elegant example below, where an open and pointing hand were worked in opposition (Figure 36). Others, such as hooked composition in Figure 37, explore the abstract balance of positive form and negative space:

Figure 36: Unknown student of Richard Hamilton. (1965) *Basic Design Exercise (Positive/Negative).* 255 x 380 mm. King's College, University of Durham. NAEA

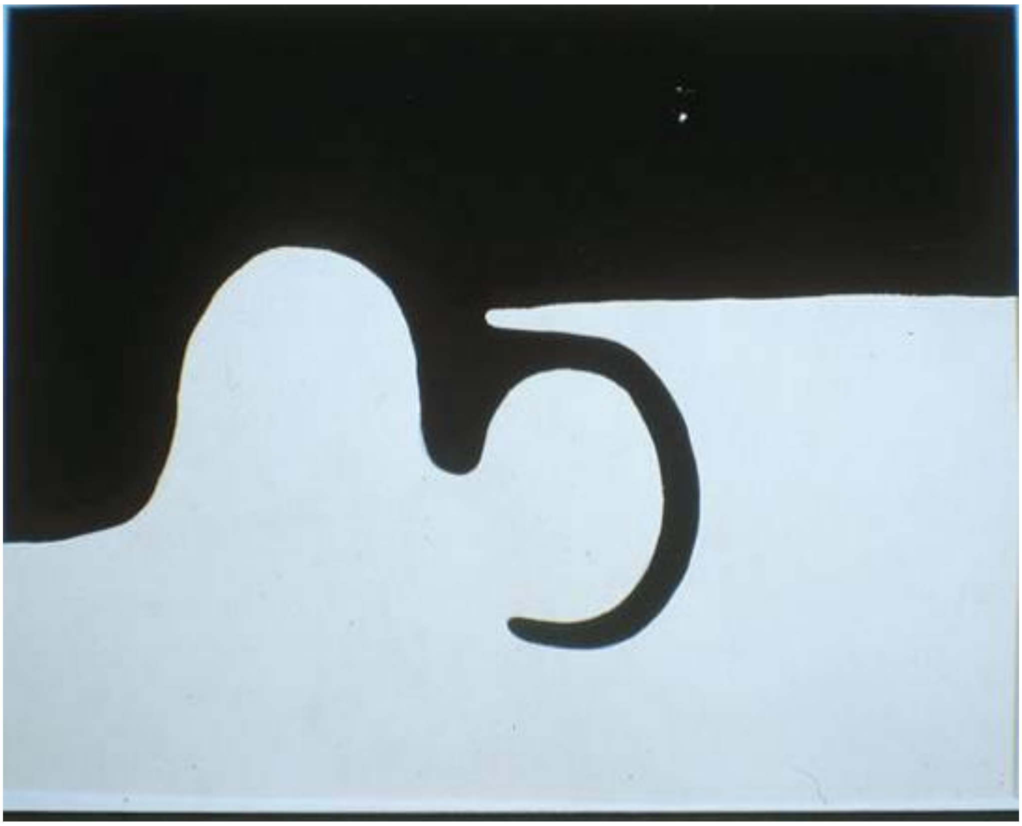


Figure 37: Fisher, L. Student of Victor Pasmore. (1959) *Basic Design Exercise (Positive/Negative).* King's College, University of Durham. 380 x 560 mm. NAEA.

In the main, these exercises were worked in the abstract, often simply black paint on cartridge paper or torn black paper collaged onto white as in Figures 38 and 39, below:

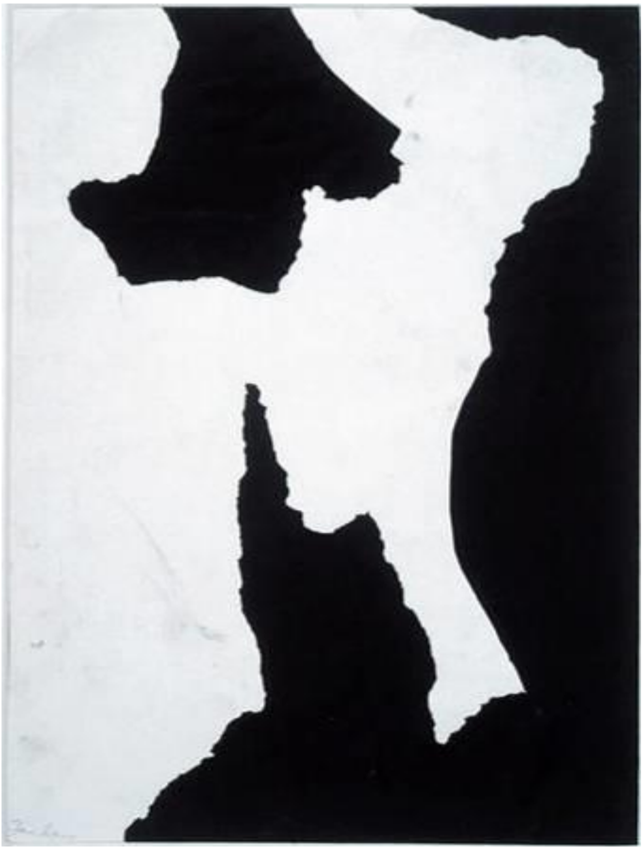


Figure 38: Farley, Student of Richard Hamilton. (1965) *Basic Design Exercise (Positive/Negative).* 255 x 380 mm. NAEA.

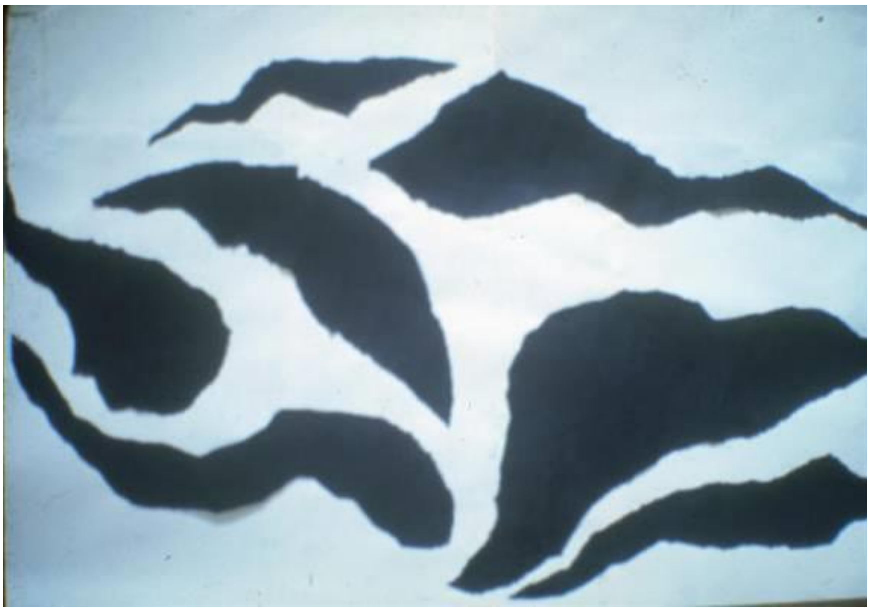


Figure 39: Anon, Student of Harry Thubron. (1962) *Shape work (Basic Design).* Leeds College of Art. NAEA.

Gestalt perception exercises such as this introduced into the basic courses a focus on the dynamism of shape and form, but also, crucially, the role of human perception in the creation of visual experiences and the transmission of (more than one) meaning. Rudolph Arnheim's contribution to Aspects of Form, 'Gestalt Psychology and Artistic Form', had clearly expressed this:

'Most images have dominant forms which, for one reason and another, demand precedence over others. Certain classical optical illusions suggest that some visual situations present a balance of forces which permit the spectator a freedom of choice. 25 is an example of an exercise in which the objective is to produce an ambiguous image. It should be possible to read it as black form on a white ground or vice versa with equal ease'[240]

It is vital to recognise though, that Gestalt was not simply a formal influence through which to explore abstract shape; it was a far more significant change of values in visual perception. As Arnheim had explained:

'...however, we mean by "form" the outer appearance of things – as we do when speaking of the arts – it is necessary to see that the Gestalt theory deals with form only as the manifestation of forces, which are the true object of its interest.'[241]

Arnheim explored the concept of optic flow with regards to the movement of water, elucidating on the point he made above - that Gestalt was an investigation of forces which created effects, finally noting:

'If we wish to understand the relationship between visual form and the total organism, we must consider the complex interaction of the many forces that make up a person.'[242]

This is certainly a systems perspective on perception, and the lessons on Positive/Negative Form must be understood in this broader context of perceptual flow, force and balance.

---

[240] Whyte. *Op Cit.* Arnheim, R. (1951) p. 206
[241] *Ibid.* p. 196
[242] *Ibid.* p. 208

iii) The Thinking Machine, the Organising Principle and Anatomy Exercises

In the 1960s, Richard Hamilton devised a series of anatomy exercises in drawing and construction which were heavily indebted to Paolozzi, collage and assemblage exercises based on the human head. Paolozzi had taken up a fellowship at King's College in 1962/3, leading to exchange between the two men. Hamilton credited this series of exercises to Paolozzi, for reasons which are immediately apparent. When interviewed by Richard Yeomans, he noted that:

> If you put any kind of lumping of an object into a roughly spherical shape, and you put them on a stalk, you immediately think of a head. I do not know that Paolozzi would have approached it in quite this way but he certainly made quite a lot of assemblages in collage material. If you made a Victor Pasmore shape, and made it with bits of cut-out car engines, like Paolozzi, it always looked like a head because it had a base. In fact that is probably the distinction. If you put a pyramid at the bottom of a Victor Pasmore shape, you would immediately think of it as a head. It has to float and be isolated to think of it as a shape and not a head.[243]

Yeomans explored some of these exercises in his doctoral thesis, in the context of collage and advertising imagery. For the purposes of this study there are two relevant points to make. Firstly, this exercise is another clear exploration of the Gestalt principle. Any assemblage of forms and objects which have the basic visual properties of rounded mass upon a stick are visually understood as a head. Figure 40, overleaf, is an 'Image and Anatomy' exercise created by John R. Myers under Hamilton's tuition. A mixture of collage and drawing, it has clear parallels with Paolozzi's practice in the 1950s and 1960s:

[243] Hamilton, R: see Yeomans, R. *Op Cit.* (1987) p. 259

Figure 40: Myers, John R. (student of Richard Hamilton). (1965) *Head (image and anatomy)*. 380 x 510 mm. NAEA.

Interestingly, this same mode of collaged form appeared in the earlier design strands of Basic Design too; Figure 41 is a poster design by a student of Albert Halliwell at Central College of Art in 1960:

Figure 41: Bambridge, N. Student of Albert Halliwell at Central. (1960) *Poster Design (Visionphone: See and Hear).* 310 x 500 mm. NAEA. (A. E. Halliwell Bequest).

The poster was for an imagined product that is now a reality – the video phone. The underlying shapes and structures in this poster recall the shape and colour exercises the student would have experienced. In addition, the mix of objects which make up the torso have the same collaged or constructivist aesthetic as the anatomy exercises examined here. The mix of popular culture imagery and mechanical form Myers employed shows strong parallels with Paolozzi, as does the content of the poster above. Paolozzi’s *Automobile Head,* below, is a simple rounded shape filled with assembled images of car engines and parts:

Figure 42: Sir Eduardo Paolozzi. (1954-62) *Automobile Head.* Screenprint on Paper. 616 x 413 mm. Tate.

The device is the same. In this period, Hamilton sent students out to collect junk and construct rough head forms from their findings in and around the college too as below:[244]

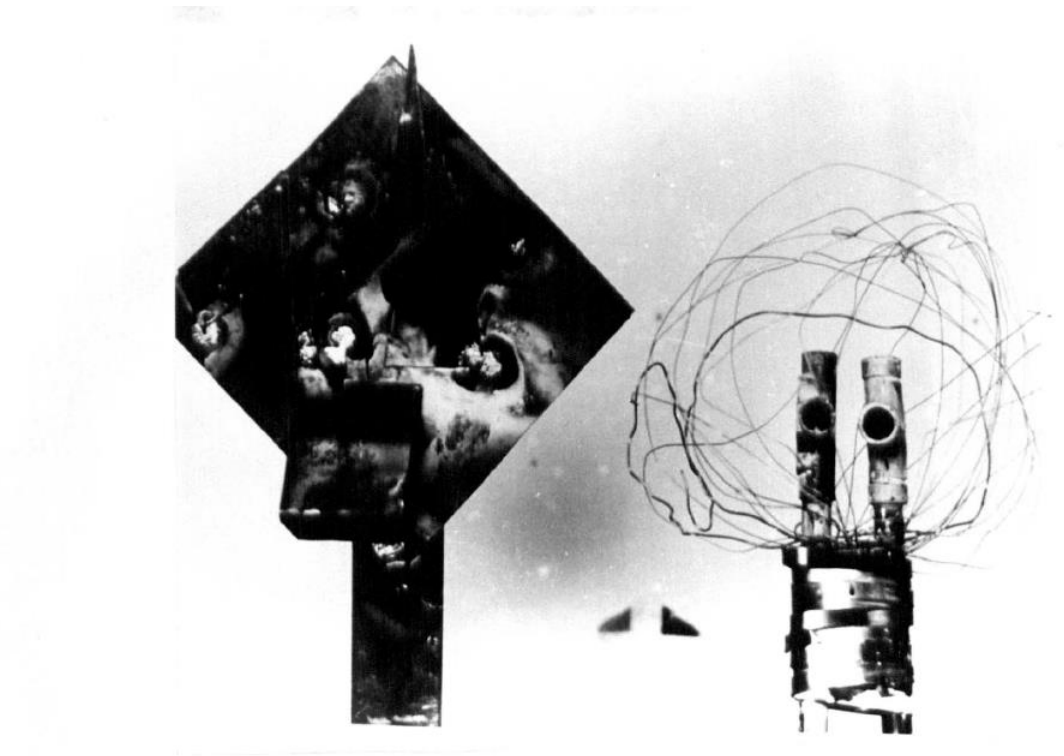


Figure 43: Anon (Students of Richard Hamilton). (1964) *Basic Design Head Constructions*.

The resultant assemblages incorporated lots of junk from skips during a college refurbishment with all manner of rubbish and found objects. This once again references Paolozzi's sculptural practice, in which he had created a number of welded figures from salvaged mechanical junk. The robot-like forms he created were just mechanical scrap re-constituted into a humanoid form, and yet they were instantly recognisable as figures:

[244] Yeomans. *Op Cit.* (1987) p. 261

Figure 44: Sir Eduardo Paolozzi. (1957) *St Sebastian I.* National Galleries of Scotland.

Many of these early sculptures were assembled for him by a welder, in part due to Paolozzi's lack of studio facilities in the period.[245] The welder would work from detailed drawings in which Paolozzi mapped out the structure for him. This kind of

[245] Whitford, F. (1994) *Interview with Eduardo Paolozzi.* Artists' Lives Project. The British Library. Transcript viewed June 2012: http://sounds.bl.uk/related-content/TRANSCRIPTS/021T-C0466X0017XX-ZZZZA0.pdf

assemblage from composite pieces has strong implications not only for Gestalt, but for systems theories too. As noted earlier, in one of the few existing articles referencing the place of systems thinking in art of the period, Erik M. Stryker wrote that both Paolozzi and Lawrence Alloway engaged with early cybernetics and systemic approaches to bodies and architecture.[246] Stryker highlighted the violence of *St Sebastian I* (Figure 44, above): the gaps implying the wounds left by arrows, the scratched, battered elements which created the body, the resulting robotic form referencing the popularisation of science fiction in the era.

Interestingly, Paolozzi remarked that during the 1950s, he and his contemporaries were working in a cold war mentality.[247] Taken in this context, the process of assemblage or collage to create form from torn and broken parts has the same nihilistic echoes as Hamilton’s point exercises which will be examined later in this chapter. In formal terms, it is only the Gestalt organising principle which makes us recognise engine parts as human features: this understanding of a collection of machine elements is entirely dependent on human perception.

While a number of the images show the strong populist content discussed by Yeomans (such as Figure 45, overleaf) others are more mechanical, a dystopian army of blank robots. There is an interesting set of images which arose from a class Hamilton set in 1964 and 1965 when the movement was beginning to decline. The students took part in an imagined anatomies class based on a series of studies they built up from life.

[246] Stryker, E. M. *Op Cit.* (2011)
[247] Whitford. *Op Cit.* (1994) note 219

Figure 45: Bayliss, Wilson (Student of Richard Hamilton). (1965) *Head (image and anatomy).* Basic Design, King's College, University of Durham. 380 x 510 mm. NAEA.

In some classes they would draw the figure in cross-sectional slices, a difficult task leading to either a series of elliptical shapes in abstract arrangement as shown in figure 46, or to regular and diagrammatic results such as those shown in figure 47 (both overleaf). These exercises fused observation with a kind of speculative mapping. Figure 47 is inscribed with a note about 'different viewpoints of contours', the resulting image looking like an unfolded form, a map of curves and points with little relation to the human form evident. It recalls the student Mark Lancaster's analytical drawing of a tin can laid flat and analysed (shown in Figure 15). Other exercises included mapping out the structure of the body as a series of points, exploring single shapes and geometries and moving around the body, overlapping the angles in a single drawing.

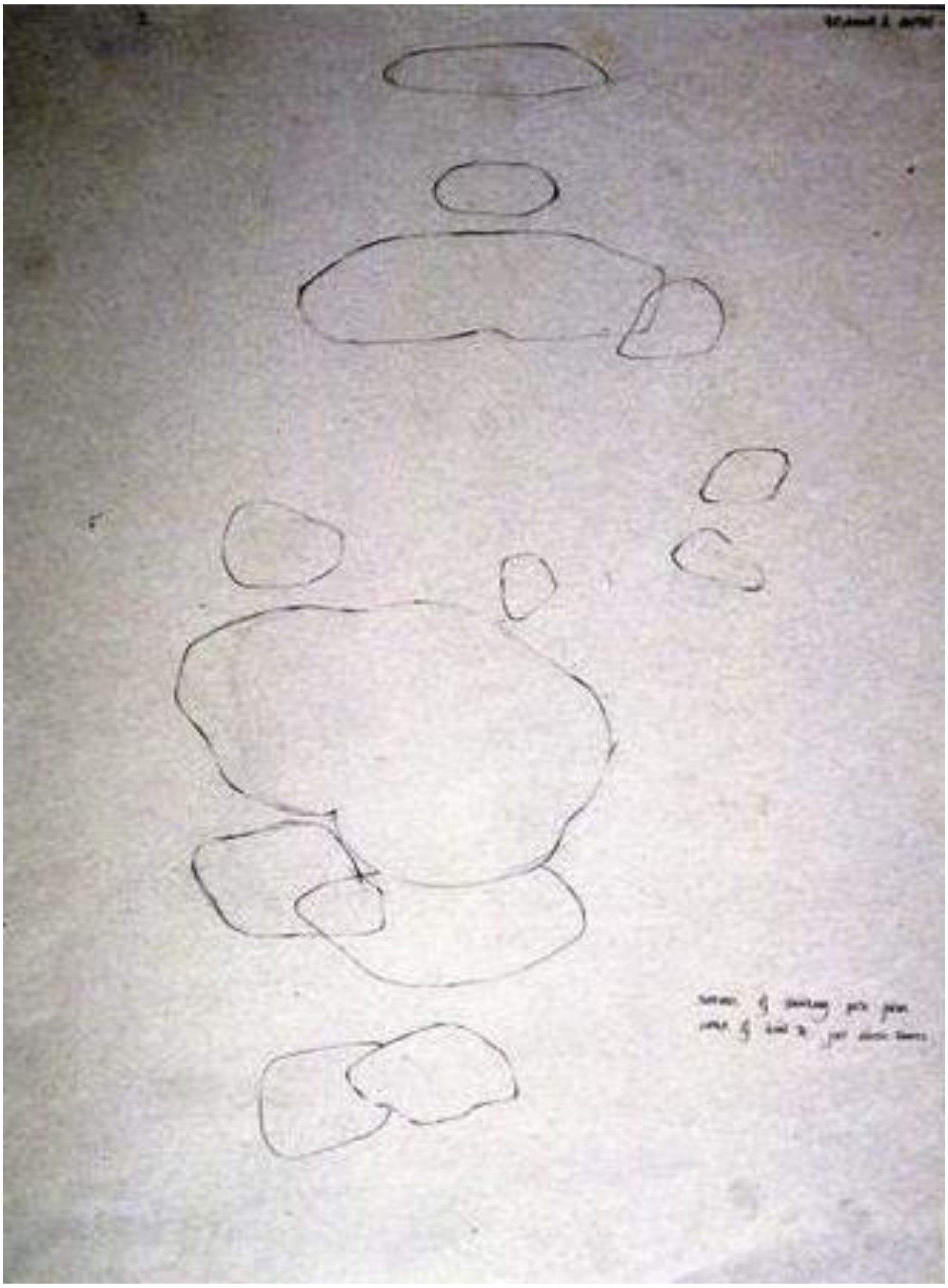


Figure 46: Rosalind A. Carter (Student of Richard Hamilton) (1965)
Life drawing-sections of standing pose from crown of head to just above the knee.(Image and Anatomy). King's College, Durham. 360 x 510 mm. NAEA.

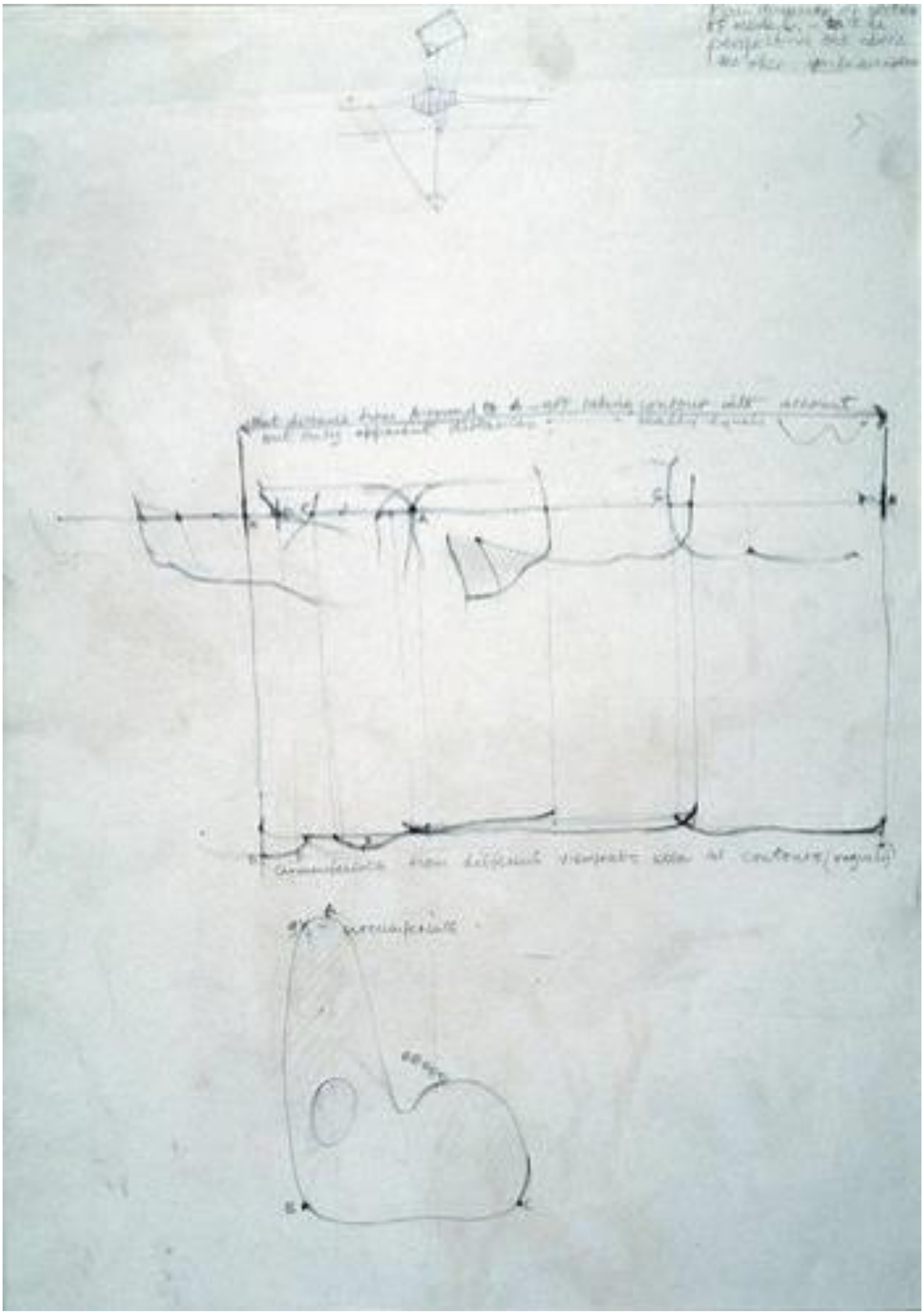


Figure 47: Anon: Student of Richard Hamilton. (1965) *Plane drawing of sections of model: T.S. in perspective one above the other (image and anatomy).* King’s College, Durham. 360 x 510 mm. NAEA.

This essential unfolding of the human form as a mechanical structure has the same quality of cool dissection as the analytical drawings described earlier. Some of the most interesting of this series of figurative drawings from Hamilton's students are the 'imagined anatomies', a fusion of the exercises listed above and a clearly cybernetic impulse. Some bodies look as if they were bolted together from plates of metal, like suits of armour (Figures 48 and 49), others are slightly more surreal combinations of mechanical parts (Figure 50) and some retain the collaged aesthetic from the 'head' exercises.

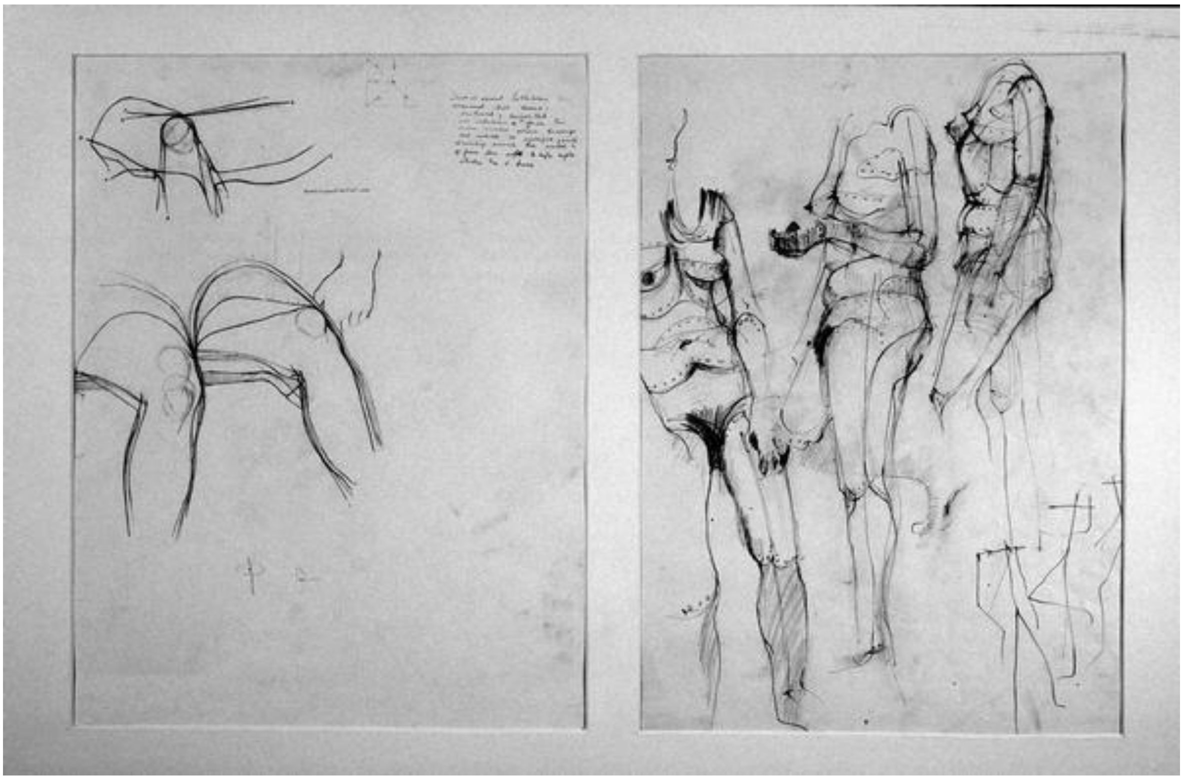


Figure 48: Anon: Student of Richard Hamilton. (1964) *Basic Design Exercise (Image and Anatomy).* King's College, University of Durham. 380 x 510 mm. NAEA.

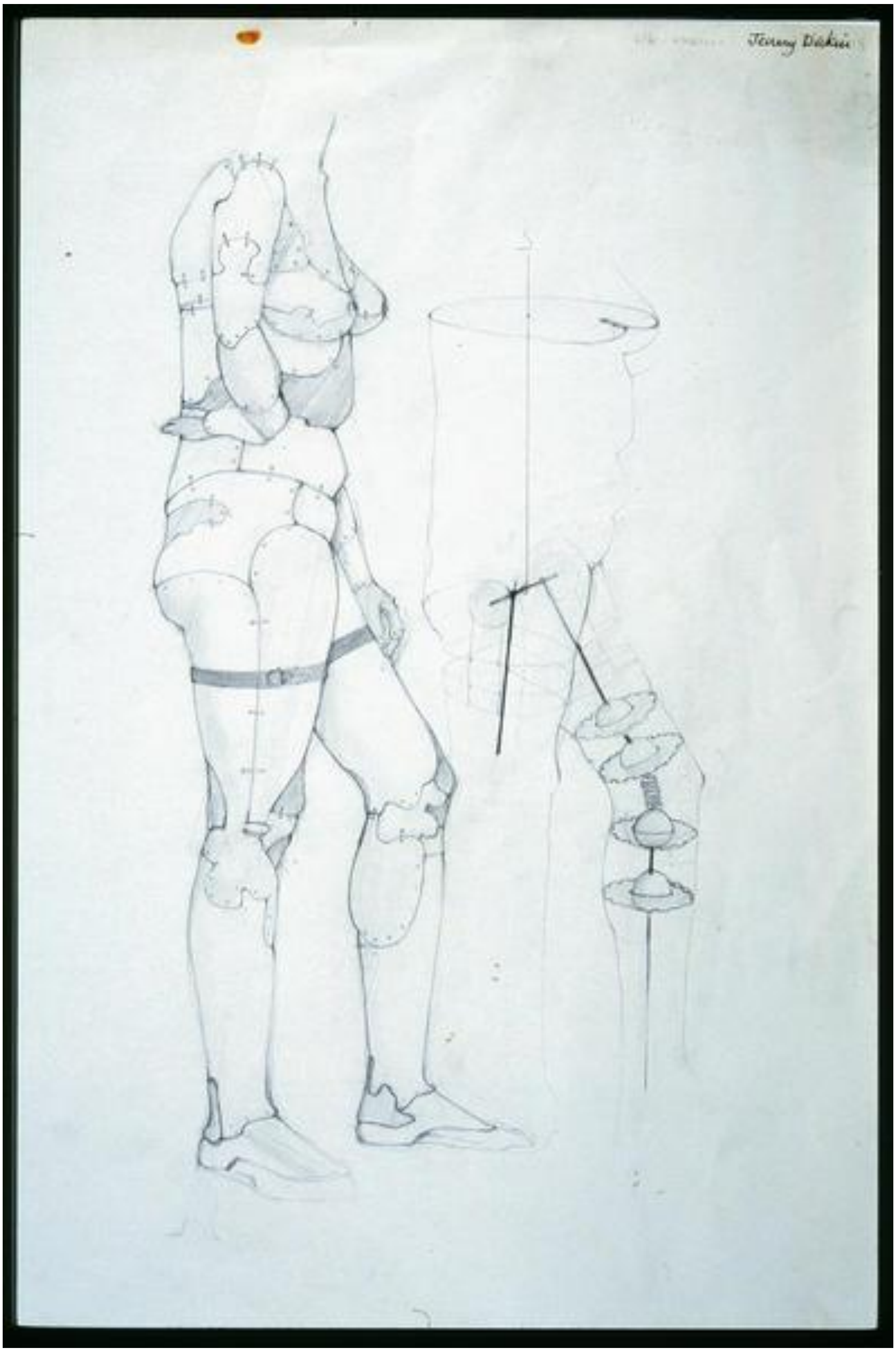


Figure 49: Dickin, Jenny. Student of Richard Hamilton. (1965) *Basic Design Exercise (Image and Anatomy).* King's College, University of Durham. 380 x 560 mm. NAEA.

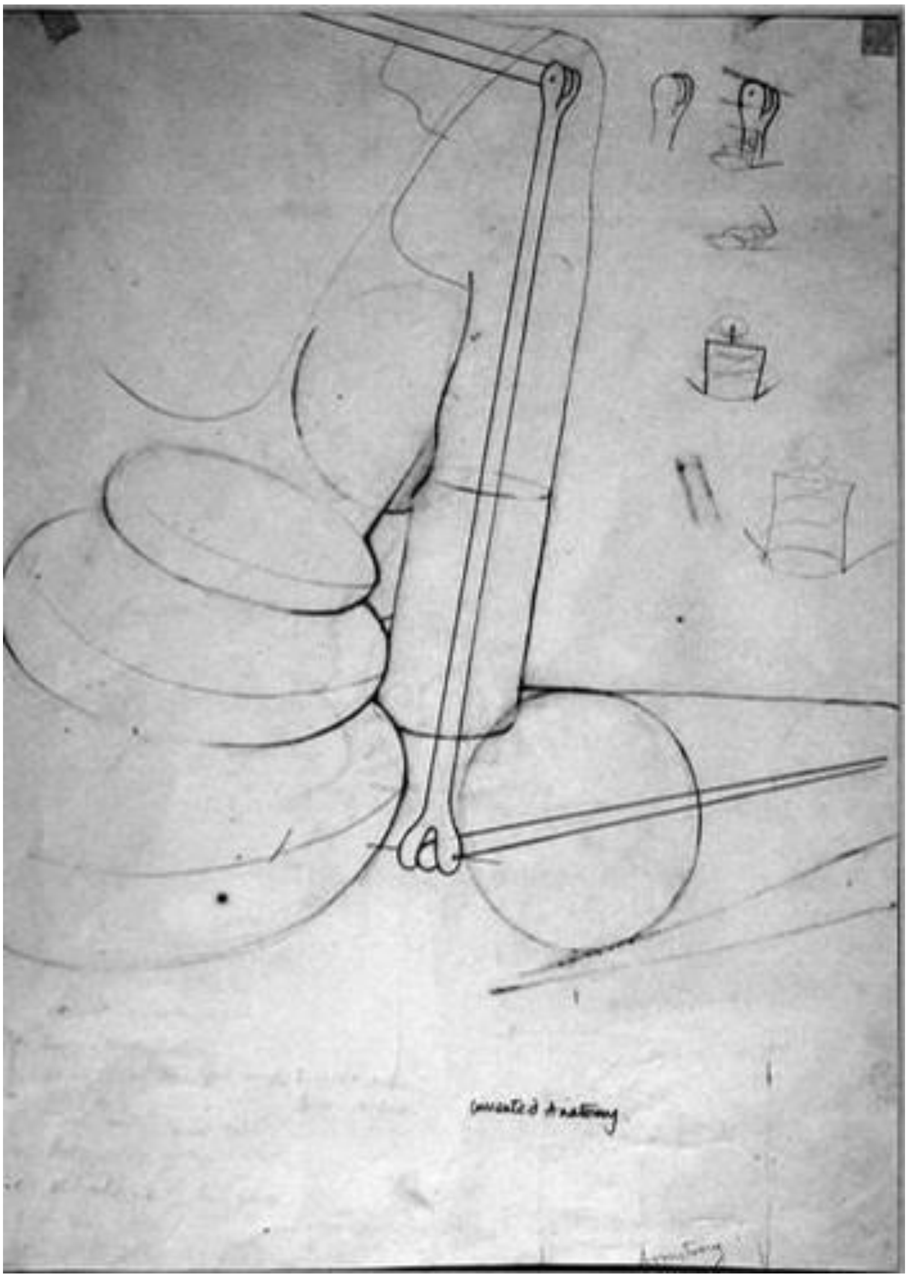


Figure 50: Anon: Student of Richard Hamilton. (1964) *Basic Design (Imagined Anatomy).* 360 x 510 mm. NAEA.

The mechanised body parts shown in Figure 50 (above) are intriguingly abstract, the torso a concertina shape like a mechanical lung which could be compressed. Unlike the robotic forms in the other examples, this particular anatomical study retains an organic sense despite its mechanical qualities. The bones of the arm are jointed inside wide tubes, but it still looks fleshy. The same is true of Figure 51, overleaf, where springs, tubes, coils and cells inside this very ordinary human figure create a pop sensibility. This collision of man and machine within the Basic Design pedagogy reflects the period of mechanical development which had just taken place and had created a world of thinking machines, a new fusion of humanity and technology.

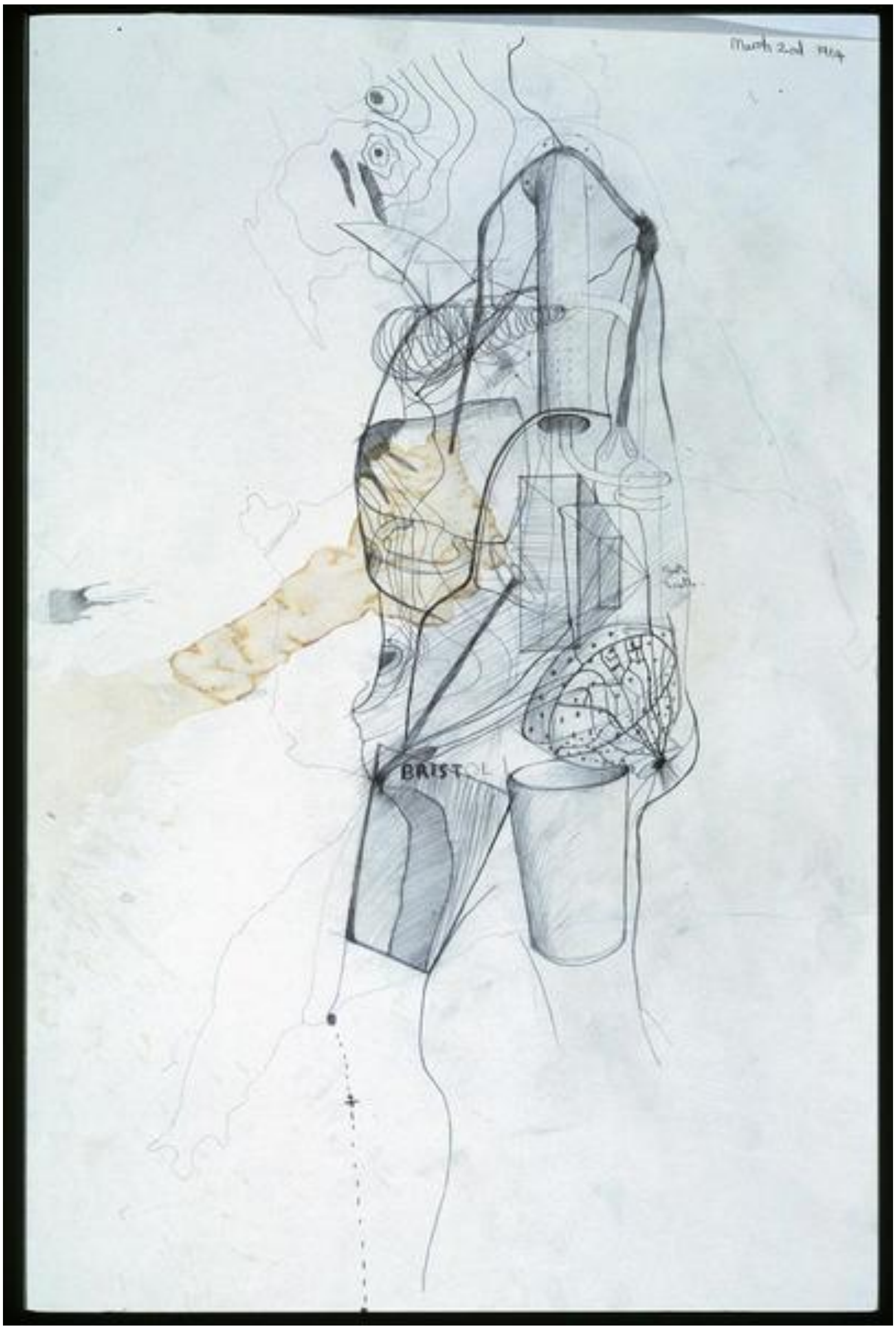


Figure 51: Anonymous. (Student of Richard Hamilton). (1964) *Basic Design Exercise (Image and Anatomy).* King’s College, University of Durham. 380 x 505 mm. NAEA.

iv) Systems theories: From Biology to Warfare

Using the physical sciences within biology transformed the single organism into a complex interconnected network of influences and elements, as exemplified by Thompson's amoeba earlier in this chapter. In his concluding statements of *Mechanization takes Command*, Giedion writes:

'As mechanization moved towards its peak, biologists recognised the deadlock into which the mechanical attitude toward research was leading them. Experiment had already proven that an organism was not entirely resolvable into its components, that it consisted of more than a simple sum of its parts.'[248]

The most vital advances in systems theories were made in the twentieth century by biologists, most notably Ludwig von Bertalanffy, who will be discussed at length below, as well as William Ross Ashby. These biologists were beginning to identify the similarities between systematic behaviour across diverse disciplines and early systems thinking led the way for advances in all manner of technologies, from weapons to computing. Ludwig von Bertalanffy was by his own testament working on a General System Theory by 1937, leading to the completion of his book *General System Theory: Foundations, Development, Applications* in 1968. A defining factor of all system theories was the desire to track systematic behaviour, often across biology, mechanics and culture: von Bertalanffy suggested that we should be seeking 'universal principles applying to systems in general'.[249]

While the usefulness of a GST which can explicate or predict behaviour across systems has long been abandoned, systems thinking evolved over the century towards network theories which were contemporaneous to, and essential for developments in

[248] Giedion. *Op cit.* (1948) p. 718
[249] Von Bertalanffy.*Op cit.* (1969) p. 32

computing. Systems theories were inextricable from technological development in a century of ever-more complex mechanics. In his introduction to *General System Theory* von Bertalanffy wrote that:

'…when it comes to ballistic missiles or space vehicles, they have to be assembled from components originating in heterogeneous technologies, mechanical, electronic, chemical etc.; relations of man and machine come into play; and innumerable financial, economic, social and political problems are thrown into the bargain.'[250]

While von Bertalanffy had conceived of the need for a General System Theory (GST) much earlier, as noted it was well after World War II that he published his book. This example he provided of the complex interplay of technologies, sciences and social influences that created modern ballistics once again underlines the role of the war in redefining the place of science in contemporary society.

The emergence of systems thinking after World War II was demonstrative of a cultural shift away from the previous focus upon the psychological and emotional value of the individual which had dominated since World War I. The industrialised world was entirely dependent on mechanics and World War I was the start of a century of technological progress of an unprecedented scale. Since the dawn of industrialisation the machine age had demonstrated, irrevocably, that utilising systemic function could help humanity achieve ever faster, larger and more complex results. This extended to the mechanisation of warfare; from the machine gun to the tank, the mechanics of war were ruthless, dehumanised and efficient. They were devastating, and the resultant psychological damage suffered by soldiers changed modern psychiatry and ushered in the golden age for psychoanalysis. By the end of World War I, the full wonder and

[250] Von Bertalanffy, L. (1969) *General System Theory: Foundations, Developments, Applications.* George Braziller. New York. p. 4

horror of the machine was ingrained into culture, and also into research across the sciences, humanities and the arts.

By the end of World War II, Systems Theory had demonstrated its usefulness and was swiftly absorbed into the new territory that was Organisational Science. Systems awareness can increase efficiency, limit or direct outcomes, encourage growth or manage change; it was thus essential to the complex logistics of the second war, which used systems approaches in order to plan operations to an extent never undertaken before.[251] This organisation of resources was an attempt to make warfare efficient, in contrast to the harsh and largely inefficient realities of trench warfare. Whereas after World War I it was necessary to disseminate the psychological legacy created by individual trauma and sacrifice, World War II saw an elaborate systematizing of warfare, a calculated approach to the transport and positioning of soldiers, arms and supplies.

Von Bertalanffy's position on the place of systems theory in society after war was one of hope: he believed that systems thinking could repair the damage wrought by reductivism, as exemplified by the development of nuclear weaponry. While I will omit the comparison von Bertalanffy made between the world and a Neapolitan ice cream ('we cannot reduce strawberry to chocolate…'), in arguing for a new unity in science he then wrote:

---

[251] See Cowan, D. "Containing Insecurity", in Graham, S. (ed) (2010) *Disrupted Cities: When Infrastructure Fails.* Routledge. Oxon.

‘The mechanistic world view, taking the play of physical particles as ultimate reality, found its expression in a civilization which glorifies physical technology that has led eventually to the great catastrophes of our time. Possibly the model of the world as a great organisation can help to reinforce the sense of reverence for the living which we have almost lost in the last sanguinary decades of human history.’[252]

In the 20th century, culture existed in a constant state of transformation due to the increasingly sophisticated machines of the contemporary world. Giedion plotted the importance of transformation and movement as an ideological influence as he explored the origins of mechanisation, aligning stillness with reductionism and movement with contemporary sciences. He wrote:

‘Movement, the ceaselessly changing, proves itself ever more strongly the key to our thought. It underlies the concept of function and of variables in higher mathematics. And in physics, the essence of the phenomenal world has been increasingly regarded as motion-process: sound, light, heat, hydrodynamics, aerodynamics; until, in this century, matter too dissolves into motion, and physicists recognise that their atoms consist of a kernel, a nucleus, around which negatively charged electrons circle in orbits with a speed exceeding that of the planets.’[253]

The speed of progress in the twentieth century is here aligned with the physicists’ understanding of the world, which Giedion described as ‘motion-process’. This physical world in constant flux contrasts directly with the clockwork mechanics of Descartes’ reductionism. As von Bertalanffy writes, the boundaries imposed in reductionist science are artificial:

‘One cannot exactly draw the boundaries of an atom (with valences sticking out, as it were, to attract other atoms), of a stone (an aggregate of molecules and atoms which mostly consist of empty space, with particles in planetary distances), or of an organism (continually exchanging matter with environment).’[254]

Thus the ‘motion-process’ world view can be linked to systems thinking, as a counterpoint to the defined boundaries of reductionist science.

---

[252] Von Bertalanffy. *Op. Cit.* (1969) p. 49
[253] Giedion. *Op Cit* (1948) p. 28
[254] Von Bertalanffy. *Op. Cit.* (1968) p. 112

Defining technology as the realm of thought as opposed to the 'feeling' role of the arts very much reflected the public face of the sciences during the 1940s and 1950s. In 1951, Jacob Bronowski wrote in the catalogue of *The Exhibition of Science* at the Science Museum in South Kensington that:

'People are often tempted to draw a more romantic picture of science: to see it as something remote or frightening, a magic and a mystery. Science is none of these things. Science is knowledge.'[255]

This exhibition was organised to be concurrent with the Festival of Britain – likewise, *On Growth and Form* was the ICA's contribution to the Festival of Britain. In an article about Hamilton's *On Growth and Form* exhibition, Isabel Moffatt examined the language of the Science Exhibition's catalogue-guide. She emphasised the safe and simple phrasing used, which she reads in the context of the background terror of nuclear armament and the threatening employment of science in Nazi Germany.[256] The bland suggestion that 'science is knowledge' can be read in this way, but also as a statement of boundaries: if science is knowledge, it is questionable what role other disciplines are to play in the modern world. Bronowski continued that:

'There are no trick miracles here, and no mechanical marvels. Instead, here is the modern world itself, standing straight and handsome on its base of science.'[257]

This very telling phrase 'straight and handsome' gives the sense that science is strong, attractive and, importantly, human – an important message in the age of nuclear fear. Described here like an ideal citizen or soldier, science was thus humanised and distanced from the bleak and recent destruction wrought by technologically advanced warfare.

---

[255] Bronowski, J. 1951. "Exhibition of Science, South Kensington," guide-catalogue, cited in: Moffat, I. "A Horror of Abstract Thought". Postwar Britain and Hamilton's 1951 "Growth and Form" Exhibition." *October.* Vol. 94. The Independent Group. (Autumn, 2000.) pp. 89-112. p. 103
[256] *Ibid.* pp. 103-104
[257] *Ibid.* p. 104

Mechanical and technological development in the twentieth century manifested themselves in the language of other disciplines – including, as discussed in this chapter, both biology and art. The influence of both wars and their technological advances upon the mechanised thinking of the twentieth century cannot be underestimated, and Bertalanffy's search for unity was therefore underpinned by a desire to repair the violence wrought by the physical sciences in the nuclear age through establishing a sense of connectivity. This was the precise reason that the Festival of Britain took place in 1951, with its clear agenda of humanising science and removing the associations of destruction and loss. In the Physics section of the exhibition, Bronowski offered an account of 'The Story the Exhibition Tells', of which the following is an excerpt:

'Going through these rooms you seem to shrink like Alice in Wonderland, and the things round you seem to grow larger and larger. There are pencil and paper in the first room. Now you find yourself apparently shrinking, first to the size of the pencil, and then to the thickness of the paper; you see that the pencil lead slides off in layers as it writes. Another step, another thousand times smaller, and you see the structure of the graphite crystals which make up the pencil lead. And then a last step, you are ten thousand million times smaller than you began, and now you see into the atoms themselves. Each atom has a heavy centre like a small sun, and the electrons move round it in clouds.'[258]

The exhibition explored the atom through the most human of tools – pencil and paper. Six years after the nuclear bombs fell on Hiroshima and Nagasaki, this celebration of the usefulness and wonder of contemporary science and technology limited public engagement with atomic science to the makeup of a pencil. The 'Alice in Wonderland' parallel is interesting in this context – the visitor was 'shrunk' so that the atom itself took up all the focus, a pure grain of energy that bore no link to the scale of destruction

[258] Bronowski, J. (1951) *1951 Exhibition of Science.* (Catalogue-guide) Museum of South Kensington. p. 14

wrought by ‘little boy’ and ‘fat man’ in the very recent past. This route the visitor had to make is illustrated in Figure 52, below, the map from the inside cover of the Exhibition of Science Visitor Guide:

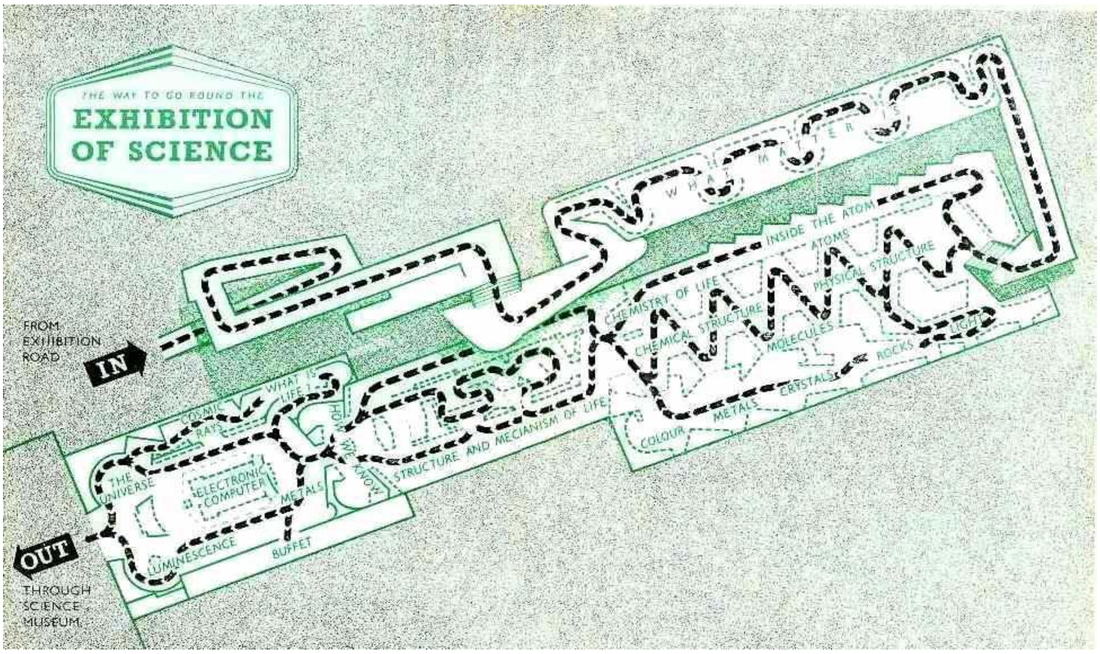


Figure 52: Anon. (1951). *Exhibition map (inside cover).*
Science Exhibition Catalogue-Guide. South Kensington Museum

Even the map itself has a circuit-like quality, both biological and mechanical in appearance. The dashed black path marking the route through the intestinal spaces of the exhibition hall have an almost electrical energy to them. From matter to the structure of atoms, then to the ‘structure and mechanism of life’ and finally to electronics and computing, it is noticeable that these key concerns of the biological and physical sciences are the same as whose which are manipulated, explored and utilised within the schools of art in the years that follow.

The prominence of the atom within the exhibition shows an attempt to normalise an area of scientific research that had caused collective trauma. On 6 August 1945 the fissure of the atoms of approximately two and a half pounds of uranium 235 had taken place 1,968 feet above Hiroshima, claiming up to 150,000 deaths by the end of that year alone. The atom had the power to cause damage on an unprecedented scale; the most reduced whole form in the physical world tore the world apart. Given that atom is derived from the Greek *atomos,* or indivisible, the discoveries by scientists in the late nineteenth and early twentieth centuries of components within the atom was a revelation with far-reaching consequences. This peaked with the two nuclear explosions in Japan; the physical sciences were thus aligned with the technology of war and at the same time our cultural perception of space folded in on itself. An atom remains the smallest whole form in the known universe, but within that structure of protons, neutrons and electrons a division of the 'indivisible' had been made.

At 8.15am over Hiroshima, the atom became apocalyptic. In 1945 the physical sciences were the obscure and shadowy power behind the real possibility of annihilation, the fear of which has endured across the decades since World War II, translated into and typified by the amorphous phrase 'weapons of mass destruction'. Perceptions of the minute forms that make up life cannot be separated from this incident, particularly when dealing with the larger cultural consequences of atomic warfare. Across faiths, cultures and belief systems, the extreme and detached violence of the bomb and the legacy of disease and death it created were received as a warning of the end of days. The contemporaneous parallel that was forged between the two atomic bombs and the end of days is best exemplified by the 1947 creation of the doomsday clock, which in name alone confirms the integration of mortal fear and biblical imagery into atomic power (see Figure 53, overleaf).

Figure 53. Anon. (1969) Scientists from *The Bulletin of Atomic Scientists* stand before the Doomsday clock, shown here at ten to midnight in 1969. This was a move three minutes to the positive, after the Nuclear Non-Proliferation Treaty was ratified in the US.

Thus even scientists created an association between nuclear warfare and the fire and smoke of doomsday, the evocative language of hell and evil, setting the hour of doom as midnight. The clock was created and maintained by nuclear physicists but it is nonetheless an artificial symbol based on a fluctuating analysis of action, reaction and possibility within the sciences and politics. Some of the most arresting images to come out of Hiroshima after the bomb were not the photographs of the immense and desolate landscape of ash, but of ordinary relics: most notably collected wristwatches, clocks and pocket watches. These stopped at the precise moment of the explosion, and there are several of such images and artefacts (see Figure 54, overleaf).

Figure 54: Anon. *Time Piece Recovered from Hiroshima.*

The carbonised remains of clocks and watches spoke of the end of days - to a greater extent than any other recovered artefacts had. In light of this, it is not surprising that the *Bulletin of Atomic Scientists* chose this same symbol to represent our proximity to annihilation. The blackened form of the pocket watch shown in Figure 49 has a concentrated, condensed stillness; at the moment the bomb detonated and the atoms split, time stopped.

v) The Abstract Point and the Atom in Basic Design

As noted, from World War II to the 1960s was an essential period of development for atomic science – and this was also the period in which Richard Hamilton was studying art, forging a teaching career, and curating his first exhibitions. The influence of atomic science upon Hamilton's pedagogical approaches is clearly defined, if little discussed. Richard Yeomans recorded Hamilton's formal interest in the elementary forms of the natural world within his wider account of teaching values at King's College. He mentions the cells, particles, molecules and atoms which fascinated Hamilton:

'The point as atom, molecule or particle has been seen in the flow diagrams of 'Diagrammar'.'[259]

Yeomans reads these layers and sub-layers of physical forms as Hamilton's absorption of *On Growth and Form* and he also offers a thorough account of the Bauhaus 'grammar of form' and its use of point, molecule and atom. However, the atom in the post-war period was a resonant symbol, representative not only of the harmonious structures of the natural world as discussed by D'Arcy Wentworth Thompson, but also of weaponry, technology and war. Basic Design needs the broader cultural context explored within this case study, particularly as a shift towards mechanised systems philosophies, pedagogy and practice in abstraction after the war.

There are, therefore, two problems to be approached here: firstly, after 1945 the atom was one of the most loaded symbols in the contemporary world. Abstraction based on

[259] See Yeomans, R. (1987) *The Foundation Course of Victor Pasmore and Richard Hamilton 1954-1966.* Doctoral thesis. Institute of Education, University of London. p. 216

atomic structure and form carries with it associations so powerful that there is an absence of discussion around how mid-century abstraction reflected the new atomic age. This critical and historical silence around the atom will be addressed below as connected to the legacy of nuclear warfare. In addition, the use of atoms within Hamilton's pedagogy will be interrogated, particularly the cultural and philosophical significance of atomic abstraction as pedagogy and practice. Key to this section will be several examples of student work from the National Arts Education Archive at Bretton Hall, the majority of which have never been published. They offer an insight into Hamilton's pedagogy, as well as evidencing some genuine innovations in his approach.

In the interwar period and at the Bauhaus, the reductive point was simply a concept, the smallest mark which would always form the first intervention into the 2d plane or the 3d structure, as explained by Kandinsky in *Point to Line to Plane* in 1926.[260] As noted herein, the same constructive and phased building philosophy which characterised the Bauhaus pedagogy did not apply in the same way to Basic Design. The single point did not end with the complex structure. It formed, instead, part of the language of possibility which Basic Design tutors presented without dictating what the pattern of development ought to be. For Hamilton, the point was not an anchor for form. It was part of a mass; the flowing mass of molecules which make up the physical world.

[260] Kandinsky, W. (1975) [1926]. *Point to Line to Plane.* Dover. Mineola.

The atom itself is a point. It is too small to imagine, just as a world consisting of atoms is too huge to imagine, numerous beyond visualisation. We can conceive of a single point, a form without any additional information, and also the flow and fluctuation of several points, like a field of energy, but this is the reach of the visual imagination of atoms, separate from the static and layered information created by diagrams. After 1945 and into the 1950s, scientists discovered dozens of new subatomic particles with their own properties, and in the 1960s these were classified in an eight-fold system.[261]

The 1960s also saw the discovery of quarks and a situation arose that is still true of today: we can predict the behaviour of atoms with a high degree of accuracy, but the strangeness and complexity of these particles and their behaviour means that we cannot visualise them. Werner Heisenberg, writing in 1962, commented that 'the elementary particles of modern physics are even more abstract than the atoms of the Greeks'.[262] There is no detailed visual information to this day as to how atoms look; the atom as a reductive point has therefore remained as such as a visual reference since the early twentieth century until today. Figure 55 (below) shows a student Basic Design point work by Gillian Hargreaves:

[261] Pullman, B. (1998) *The Atom in the History of Human Thought.* Oxford University Press. Oxford. Pp. 258-262

[262] Heisenberg, W. (1962) *Physics and Philosophy: The Revolution in Modern Science.* Harper. New York. p. 70a

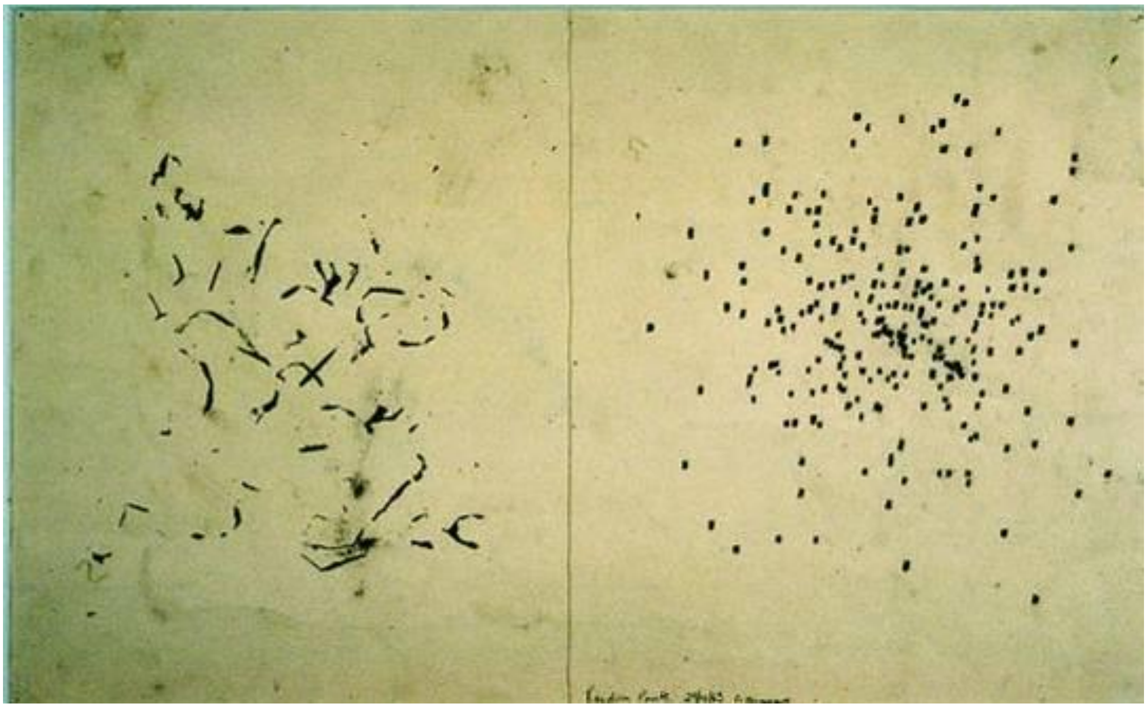


Figure 55: Hargreaves Gillian, student of Richard Hamilton. (1963) *Exercise: Random points. Basic Design work.* 510 x 320 millimetres. NAEA.

On the right of the paper a cloud of dense, reductive points taper outwards like an explosion of energy. On the left, a series of imprinted marks create the same sense of outward energy. In many of his point classes, Hamilton was explicit about the ideas of molecules, atoms and flow in the exercises he set. We can therefore refer some of these images directly to the atom, and this presents an interesting visual problem: for these abstract depictions of atoms are as good as any visualisation that science can offer. The atom is beyond the eye. As well as those images which were demonstrably involved with atoms and molecules, there is also the underlying problem of what the reductive point could mean in the post-war world. Whereas Kandinsky’s point was a solid additive quantity upon which a structure was created, this was certainly not true of the masses, flows and networks produced by Hamilton’s students.

In a Second Year Curriculum document from the 'Basic Form' course at the Fine Art department of King's College, University of Durham, the first week begins on a Tuesday morning with an exercise called *Point and Line (with matches and abstract).*[263] Point formed one of the key elements of the Basic Design approach along with line, shape, structure and colour, at all the schools of art that developed Basic Courses. In this second year exercise, students threw the matches at a line, and then recorded the results in a drawing. Figure 56, below, is one such drawing. A faint pencil line is visible at the centre of the paper, and around it dense black marks gather as if drawn together by an unseen force. There is a magnetic pull at the centre, a mass of energy moving inwards.

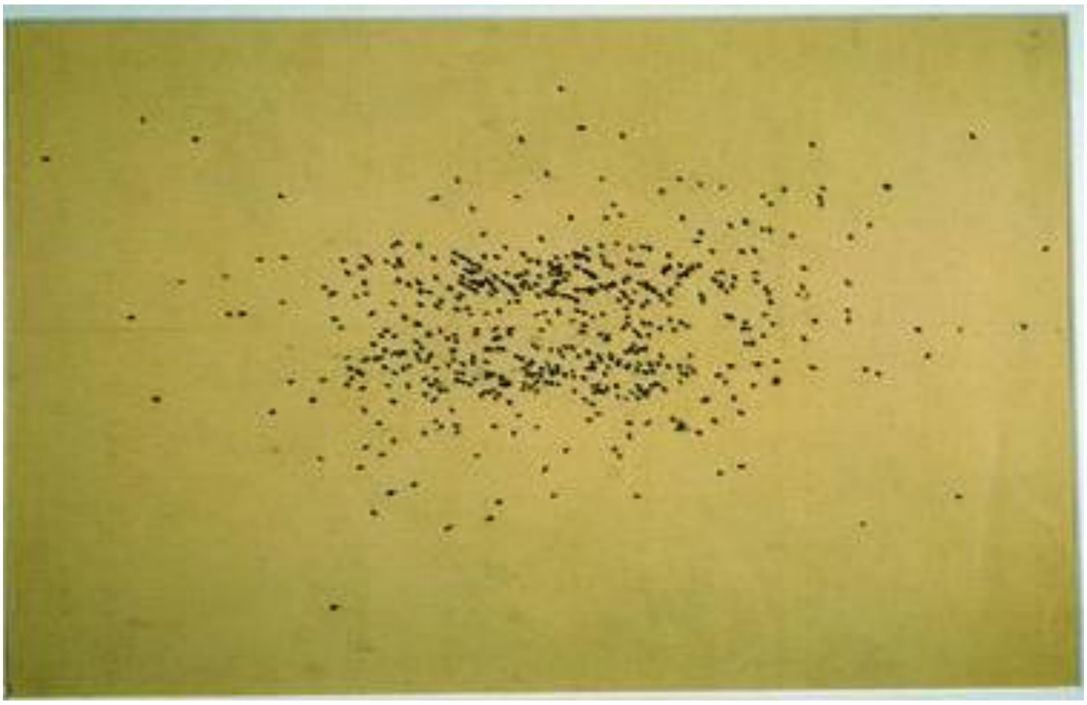


Figure 56: Anon: Student of Richard Hamilton. (c. 1960) *Drawing: Point-matchsticks aimed at the Central Line. Basic Design Work.* 370 x 560 millimetres. NAEA.

[263] Basic Form Second Year Curriculum Document, King's College, University of Durham. See Yeomans, R. Doctoral thesis.

For Hamilton, the notion of striving for a high quality outcome within these exercises, and indeed the idea that quality would vary from student to student, was irrelevant. In *Diagrammar,* a short article about Basic Design from *The Developing Process* exhibition booklet, Hamilton wrote that:

'The tasks I set my first year students are designed to allow only a reasoned result. Rarely is a problem presented in terms which permit free expression or even aesthetic decision. The student is prompted to think of his work as diagrams of thought processes - equipment which will enable him to derive further conclusions. Artistic personality or manipulative charm is coincidental to the result.'[264]

The fall of matches on or around a line is limited only by physical factors such as hand-eye co-ordination, surface texture, speed and motion. The resultant drawing was, in Hamilton's eyes, free from 'expressive or even aesthetic decision' – this kind of detached process and response has a mechanised objectivity to it. Furthermore, the alignment of visual language with scientific experiment is clear in the limiting of possibility, or 'demarcation' of this exercise. Any variety in the work of one student to another's would be the result of the variables listed above. Remaining mindful that this exercise was intended to form part of a student artist's training in the basic language of art, the philosophical underpinning of this pedagogical approach is almost nihilistic. The established framework of meaning, artistic value or communicative purpose gave way to a spatial-philosophic exploration of point. This is also true of Figure 57, a Basic Design point exercise by B. H. Lore:

[264] Hamilton, R. (1982) "Diagrammar". In *Richard Hamilton: Collected Words 1953-1982.* Thames and Hudson. London. p. 6197

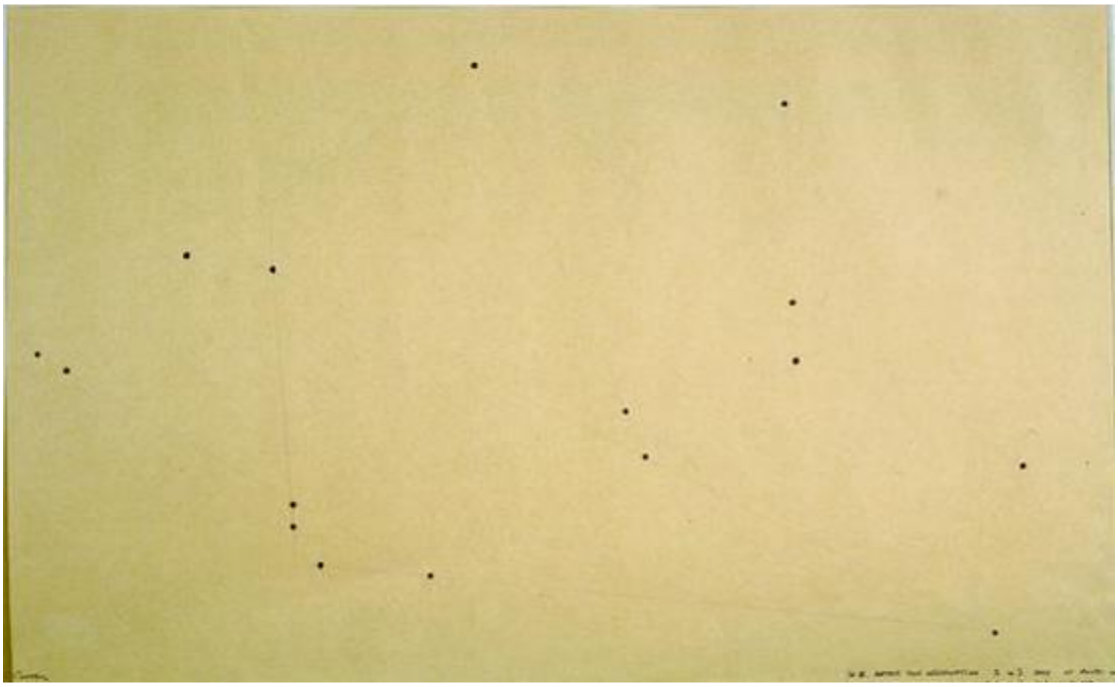


Figure 57: Lore, B.H, Student of Richard Hamilton. (1963) *Exercise: Point. Basic Design work.* 560 x 380 millimetres. NAEA.

There is little information available about this point exercise, but we can see from the outcome that there is a concentrated precision about the black points on the page, linked by a faint geometric framework in pencil. The fractured geometries of the under-drawing created a connective network, emphasising the relatedness of each point to another point. The faint pencil marks create hesitant connections between forms – in the first, representing the line at which match-sticks were aimed, in the second, an underlying structure of connectivity defining where a point is positioned: as soon as two points are present, a line is suggested between them. This exercise has the closest echoes of the Bauhaus in its additive structure, and yet the structure itself has far less emphasis than the points.

To imagine the world in its atomic state is to sense the dissolution of boundaries, the whole form giving way to a multiplicity beyond understanding, a complex mass of interactions and flows, networks between these tiny unitary points. Planets, places, people, animals, organisms, molecules become part of the ebb and flow of the universe and thus too large and too small to picture. The emergence of systems thinking amongst Hamilton and his contemporaries has been discussed earlier in this chapter, but it is worth noting here that systems thinking has atomic connotations too. One of the most fundamental ideas of systems theory is that of emergence: out of one system, another layer or level emerges, such as molecules to organism, organism to species, neurons to consciousness, individuals to societies. Theoretical biologist and systems theorist Stuart Kauffman writes on theories of emergence that:

'...the collective system does possess a property not possessed by any of its parts. It is able to reproduce itself and evolve. The collective system is alive. The parts are just chemicals.'[265]

This is a good summary of the theory of emergence in that it highlights the collective interaction from which it arises. Kauffman's stresses that matter does not come to life until it is part of a system – true on all levels of the natural and physical sciences; true of culture too.

It is possible that engaging with networks and masses was a way of overcoming the overwhelming scale problem and the resultant philosophical problematics of the atomic age. As noted previously, the originator of General System Theory, Ludwig von Bertalanffy, saw systems thinking as a possible way to repair the damage done by nuclear war.[266] When we take in the elemental interactions that make up theories of emergence, it is clear that the science, the philosophy and the sociology of systems

[265] Kauffman, S. (1995) *At Home in the Universe: The Search for laws of Complexity.* Penguin. London. p. 24
[266] Von Bertalanffy. *Op. Cit.* (1968) p. 112

theory are underpinned by a positivism which we can relate to the recent war, despite the place of systems within weaponry design and war logistics. In addition, systems thinking overcomes the complex and overwhelming divisionism of atomic knowledge.

Other examples of Basic Design 'point' exercises from Hamilton's students clearly represent structures and flows of particles. One of the best-known examples of this made up the cover image of the catalogue for *The Developing Process* (see Figure 58, overleaf). For this exercise, Hamilton asked students to imagine a flow of particles encountering an established form with boundaries, and parting around it. Thus there is a field of energy around the solid forms - a solid rectangle in the centre and the title bar. Around the central rectangle there is a disruption of direction, marks overlapping and clashing, but the overall flow is like a river of energy descending from the top left of the image:

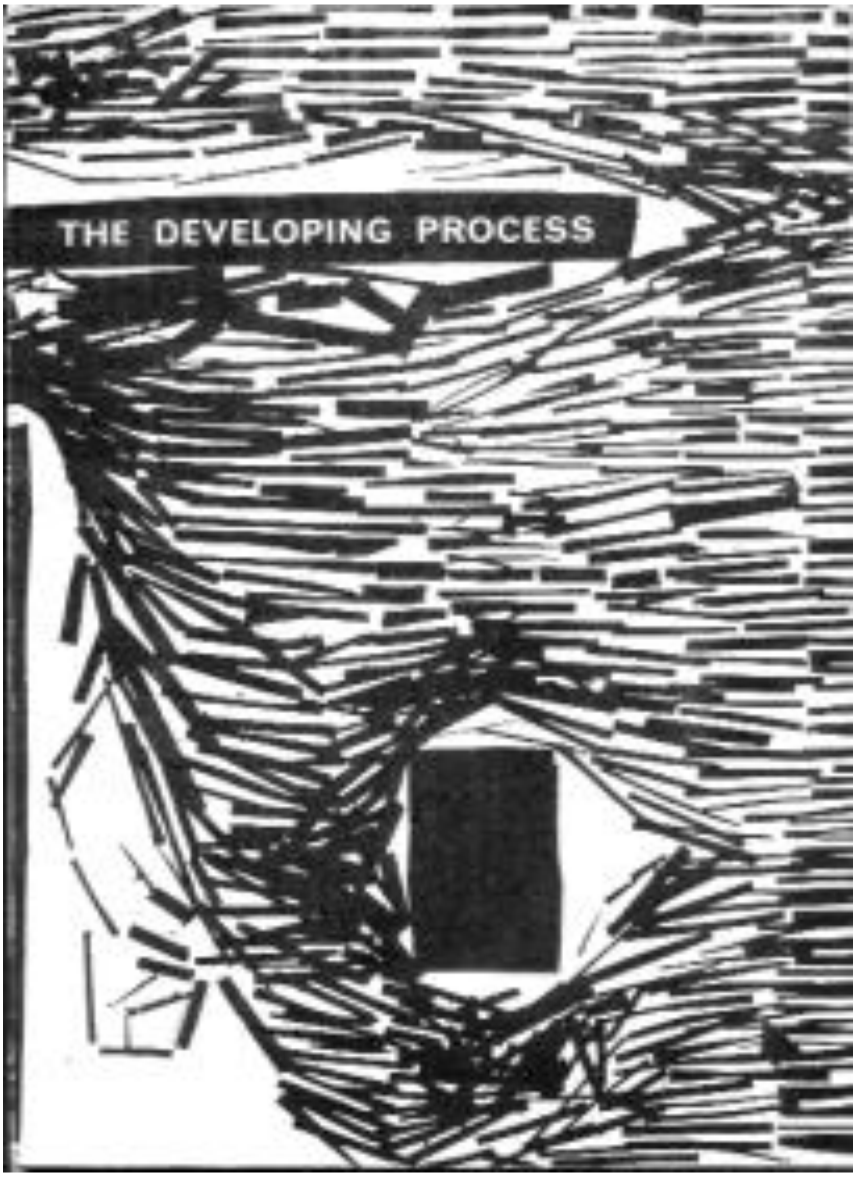


Figure 58: Richard Hamilton. (1959) Cover for *The Developing Process* exhibition booklet.

In *Diagrammar* Hamilton wrote:

'…the student is required to position several forms on a sheet of paper. There is then assumed to be a flow from one side to the other - small pieces of paper are stuck on to indicate the response of the flow to the forms. The process of revealing the currents and cortices, the high and low pressure areas, requires no aesthetic decision: the position of each mosaic particle is determined only by a logical estimation of the energies developed as a result of the conflict between the even flow and the fixed forms fairly arbitrarily established in the first instance.'[267]

[267] Hamilton. *Op. Cit.* (1982) pp. 61-62

Hamilton’s claim that this task required ‘no aesthetic decision’ was untrue – the aesthetic decision lies in the abstract notion of a current running across the page. This is formless before individual decisions, each student deciding the rhythm and direction of the forms on the page. The terms Hamilton used here are representative of a new way of thinking about abstract form: ‘revealing the currents and cortices’, as if through this formal exercise students were not creating, but drawing to the surface a flow of energy within the planar surface before them. It was a process of ‘logical estimation’, an attempt at an objective understanding of the balance of form and energy. Both the perimeters set by Hamilton and the terminology used reveals not only a detachment from the individual and expressive legacy of abstract expressionism, but also an abandonment of aesthetic ‘value’. This is a reduction of visual form to matter. The problem this quasi-nihilism poses can easily be summarised: *ex nihilo nihil fit.* Nothing comes from nothing.

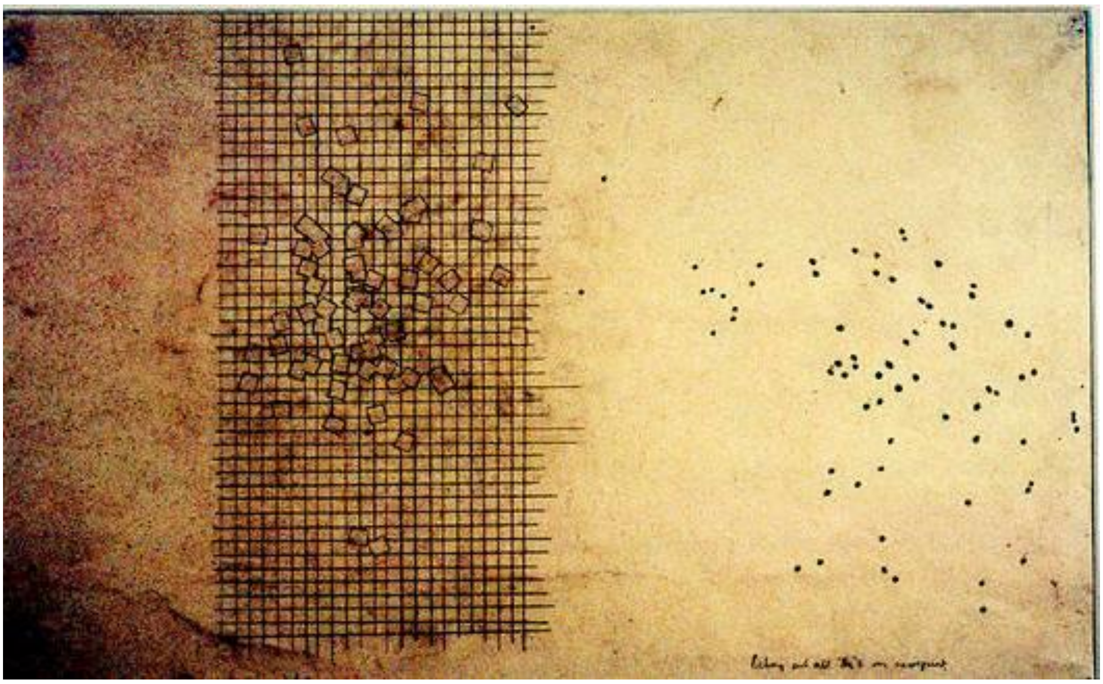


Figure 59: Hargreaves, Gillian, Student of Richard Hamilton. (1963) *Exercise: Point- picking out all "THE´s" on newsprint. Basic Design work.* 510 x 320 millimetres. NAEA.

In another point exercise students were required to cut set words out of newsprint, such as the example by Gillian Hargreaves, in Figure 59, above. From the image it would appear that the words were cut with a scalpel and dropped on a grid, and that the resultant pattern of holes in the text may have been translated into a series of condensed points. This exercise took connective words such as ‘THE’ or ‘I’, words that appear frequently and form the structure of a narrative without holding the meaning. Yeomans compared this exercise to Tristan Tzara’s Dada poetry recipe, shaking words in a bag and drawing them out randomly to form the poem.[268] In the context of this chapter, the meaning must be read quite differently.

Language is immaterial here; poetry irrelevant. The resulting drawing records only experience and action, and its relationship to written language is simply this: language as structure, words as particles. These exercises are not design in any clear sense, in that they do not work towards satisfying any practical outcome, product or function. The matchstick exercise is about process and result, about analytical ability and spatial awareness. It is an exercise in a mode of objective abstraction: that is, abstraction led by a series of objective decisions and physical rules, rather than by the emotive and individuated agenda of abstract expressionism.

Figure 60, overleaf, is a student point exercise with a subtle violence about it: lines pour from a narrow channel and dissipate into precise, hard marks. The overall composition has the sense of collision and rupture, like the colossal shift of the landscape after an earthquake. The suggestion of violence and collision here aptly

[268] *Ibid.* p219

illustrates the silent but vital problem in this post-war exploration of the atom in abstraction: the very recent nuclear explosions in Hiroshima and Nagasaki. After World War II, the atom was not simply one of the building blocks of life; it had a complex place in the modern world as the interface between the natural world and technology. More importantly, it stood for both the fabric of life and the uncanny and unnatural desolation of nuclear warfare.

Figure 60: Anon: Student of Richard Hamilton. (1965) *Point, Basic Design Work.* NAEA.

The exploding masses depicted in Figure 60 recall another problem of visual imagination; the nuclear bomb. A reaction rather than a weapon, a case of matter rapidly changing form. As Alan Woods writes, 'Matter and energy (which is merely two ways of saying the same thing) can neither be created not destroyed, only transformed.'[269] Paul van Dijk, in his study of the technological anthropology of

[269] Woods, A. & Grant, T. (2002) *Reason in Revolt: Dialectical Philosophy and Modern Science.* Algra Publishing. p. 105

Gunther Anders, summed up Anders' position on the human reaction to nuclear warfare:

'Although the bomb, just like the nuclear reactor, is not "phenomenal", of its essence not a sensually observable phenomenon, it can likewise not be classified as *"noumenal".* It is not a thing in itself, not an "object of non-sensual perception", but highly real, particularly in its effects.'[270]

In this strain of critical history, nuclear weaponry is real but it is blank; neither perceivable with the senses nor in the noumenal - or abstract - realm of ideas. Nuclear terror has a character similar to the unfathomable roar of chaos, tearing through the order of the world and turning upside down the harmonious structures of human life. Van Dijk continues:

'It is not a means because it cannot merge, like other means, into its end, unless the end of life on earth is its intended goal. And it is certainly no weapon, as the official reading would have it, because its operation transcends every goal or assigned function. Since the effect of the bomb, which is inseparable from its essence, is beyond every concept as it is ontologically "unique", Anders calls it "monstrous". Creatures that could not be classified used to be called "monsters". "Monsters" were creatures that existed even though they were without "essence". The bomb is such as "creature". It exists, though without essence. It's "non-essence" makes us hold our breath..."[271]

Anders' early contribution to the anthropological interpretation of modern technologies summed up the comprehension of the atom bomb as something outside of the phenomenal; something that cannot even be understood as a power or a weapon, so complete and unnatural is its destruction. He also outlined the precise fear of atomic warfare as a kind of invisible terror or 'monster', despite its reliance on palpable technologies such as the piloted plane. It is the very monster which the Festival of Britain tried to replace with their 'straight and handsome' humanisation of science.[272]

---

[270] Van Dijk, P. (2000) *Anthropology in the Age of Technology: The Philosophical Contributions of Gunther Anders.* Rodopi. Amsterdam. P. 136
[271] *Ibid.* p. 136
[272] Bronowski. *Op Cit.* (1951)

In *Retour au Postmoderne*, Jean-Françoise Lyotard gives 1943 as a potential date for the advent of postmodernity.[273] Despite this, the vital link between the collective experience of the war and the rapid cultural developments of the post-war years is a problematic one, dominated by theories and critical histories of dislocation, rupture and total change. In their 2010 article 'Interrogating Trauma: Towards a Critical Trauma Studies', Antonio Traverso and Mick Broderick note that:

'A broad look at the field of trauma studies shows that while the application of the notion of trauma to the analysis of history, culture and politics is widespread, the methodological distinction between this term's original psychological denotation and its analogical use in relation to the socio-cultural realm is often ambiguous if not altogether obscure.'[274]

This article was the introduction to a special issue of *Continuum: Journal of Media & Cultural Studies*, in which the authors explored different facets of trauma theory within an international context. Editors Traverso and Broderick wanted to widen the debates of trauma studies beyond the perimeters of the experience of the Holocaust in the west. In this introductory essay they highlighted a key issue with the concept of trauma; the distance between trauma as a kind of injury and the additive – and essentially positive - processes of creative production. They comment that:

'Significantly, it is the analogical physicality of the traces left by the past in traumatic memory – a violent latency of the past in which memory is imagined as a wounded body – that complicates attempts to understand trauma in terms of cultural representation. This is so because trauma's inherent nature would be to neutralise the habitual processes of symbolization and narrativization through which personal, family and cultural memories and identities are woven.'[275]

[273] "Lyotard, J. F. (1985) "Retour au postmoderne". *Magazine Littéraire.* 225. December 1985. p. 43.
[274] Broderick, M. & Traverso, A. (2010) "Interrogating Trauma: Towards a Critical Trauma Studies". *Continuum: Journal of Media & Cultural Studies.* 24:1. pp. 3-15. p. 4
[275] *Ibid.* p. 5

Susannah Radstone explored this problem in an earlier article, which argued that the concept of a collective traumatic event is possibly better treated as a 'compelling metaphor' as it diverts:

'…attention away from the processes of articulation through which past happenings and the meanings and affects associated with them are discursively produced, transmitted and mediated'[276]

There is a definite dissonance between trauma studies and the continuing presence of the war in evolving models of cultural pedagogy and production in the post-war period. In this strain of criticism, the war left society inhabiting a cultural wasteland where all the enduring values and principles underpinning positive, progressivist culture had been reduced to ash.

Given that this thesis holds very specific evidence for the extent to which war technologies infiltrated into the material culture of the art school, I argue that theories of total rupture or erasure cannot be practically applied to cultural production. Furthermore, the exploration of themes of war technologies within the school of art demonstrates a continuity of awareness and presence which contradicts the concept of grand rupture. Beyond the initial and contrasting moral reactions to this disaster of war, the post-war years saw a realignment of values in philosophy, a move away from historicism towards the plurality of perspective and approach that characterised postmodernity. This plurality was another facet of the systems culture that evolved after the war, permeating teaching practice at Central, King's, Leeds and eventually provoking changes to national educational policy.

[276] Radstone, S. (2005) "Reconceiving Binaries: the Limits of Memory", in *History Workshop Journal*, 59:1: pp. 134-150. p. 137

Systems in the Post-War Art School:
Basic Design, Groundcourse and Hornsey

Catherine Sloan

VOLUME II

PhD

The University of Edinburgh

2013

2. GROUNDCOURSE

EALING AND IPSWICH

Groundcourse Behavioural Project Ipswich 1965

2.1) Experiments in Foundation Studies

My purpose with this case study is to reassess the impact of post-war technologies on Roy Ascott's early pedagogy in his first fulltime teaching posts at Ealing and Durham: Groundcourse. This is in line with the broader aim of this thesis of establishing the material and conceptual impact of the war on radical pedagogies. As noted in my introduction, there is little existing literature on Groundcourse and there has been no extended visual analysis of the fascinating student work created as part of the course. Because of this deficit of sustained analysis, this rich and complex pedagogical model has never been fully explored within a broader cultural context. An essential element of this chapter is, therefore, the visual analysis of Groundcourse exercises in their post-war context and the decoding of the highly evocative technology-driven concepts behind the course.

The 1960s was the period in which the DipAD was implemented, moving art training towards academic status. Given the focus on individual practice which has evolved since the academicisation of visual art training, it is notable that some of the most experimental and controlled approaches in art education also took place in the 1960s. The more systematised the approach to a course, the less value there is granted to individual attainment: indeed, there was no passing or failing on Groundcourse itself based on relative value. To attend and to participate meant to pass. However, there was plenty of failure afterwards when student portfolios were centrally reviewed; an issue which will be discussed later in this case study. In Emily Pethick's short article *Degree Zero* published in Frieze Magazine in 2006, she writes:

'…it is curious that, while renowned at the time, they [the courses at Ealing and Ipswich] have not been more widely acknowledged in British art history. While some of the more extreme behavioural experiments may now appear somewhat questionable, when viewing them in relation to the more static models of art education today one cannot fail to recognise them as moments in which the art school became a site of critical engagement between practising artists and students that were active in testing out new methodologies and models of practice, foregrounding participation, the importance of play as an artistic strategy, the potential of art and education to have a relation to society and the possibility for change.'[277]

The brief article offers an overview of Groundcourse pedagogy. Pethick noted in her closing statement above the surprising lack of art historical discourse around the subject. Six years on this deficit of published resources still exists and the subject of early cybernetics and the visual arts is also surprisingly little-discussed. The technologies of World War II and the Cold War had a clear and measurable cultural presence in the post-war years; Groundcourse in itself is a legible example of both the psychological and material impacts of these new technologies in the visual arts.

Ascott's background prior to his art school education was somewhat unusual in that he experienced Cold War technologies first-hand. He arrived at King's College, University of Durham in 1955 for an art school interview in an Air Force car. This moment is recounted gleefully in a number of short reviews of Ascott's career as a collision of one life with another; a measure of the transition which Ascott was about to make.[278] That car had transported him from Edinburgh to Newcastle - at Turnhouse outside of Edinburgh he had, for two years, been engaged in the surreal game of fighter

[277] Emily Pethick. (2006) "Degree Zero". *Frieze Magazine, issue 101,* 2006

[278] See Shanken, E. A. (2003), Bracewell, M. (2008), Pethick, E. (2006)

control. Positioned on the side of a pit looking down upon a large table-top map, Ascott had monitored radar readings, his findings plotted out on the map below with small plastic model airplanes by staff with long sticks. Next to him was a bright red phone which on the event of a confirmed unauthorised plane, he had to pick up in order to send fighter jets into the air to investigate. A game played out with the latest technologies and a series of plastic pieces; a game made necessary by the technological tensions of the Cold War. Shanken writes:

> 'In the classroom, cybernetics offered a clear model for reconceptualizing art and education –and their roles in a larger social system – by suggesting the organisation of art education curricula in terms of a behavioural system of feedback and control.'[279]

This interesting statement highlights the key qualities of Groundcourse – the course was a system in its totality, each aspect of the curriculum intended to interact with the whole, each individual participant part of this interactive system. This raises important questions about the issue of agency and control within the course - as well as within the wider culture of art teaching in the 1960s - which this study will address. While Groundcourse was intended to liberate the student from their own behavioural confines through a series of psychological and creative exercises, their progress was managed by a carefully-constructed and phased curriculum. Much as the Basic Design movement - which formed part of Ascott's training – favoured process over outcome, so Groundcourse favoured the totality over the individual.

Arriving at King's College and making the transition from Air Force to Art School is not the important element of this much-repeated anecdote. What it demonstrates is Ascott's early formative experiences in cybernetics which he would explore over the

[279] *Ibid.* p. 35

coming decades in his art and pedagogy. The first – and in many ways the most vital and surprising - phase of this exploration came when he entered his first teaching posts in Ealing College and then Ipswich from 1963. Within this case study the formative experience Ascott underwent in terms of his RAF service and his early training will be analysed as well as the course itself.

i) The Introduction of the Foundation Course

While other arts subjects such as music and literature admit students straight from school, visual arts and design subjects normally expect students to have attended a foundation course, or at the least undertaken a portfolio preparation course of some description. There is the assumption in this educational process that the visual arts are more ideologically complex and more technically challenging than other academic and creative subjects. While there are foundation courses in other areas, none are built into the academic system in the way of art and design foundation studies. While medicine students learn the complexities of human anatomy through dissection straight from their secondary education, fine art students tackle the complexities of visual communication only after this bridging year has been completed. One might speculate that the fine art foundation course endures only because of the distance, in the 1960s, between secondary art education and the evolving forms of modern art.

It was *The First Report of the National Advisory Council on Art Education* (the first Coldstream Report) of 1960 which concretised the place of a 'pre-diploma' course for art and design students. Victor Pasmore played a key role in vocalising the Basic

Design philosophy of education as part of the Coldstream committee, something which came across in the resulting recommendations. The report stated that:

> 'For many people the term "fine art" has too restrictive a connotation and it is not by any means generally accepted that all students, whatever subjects they are studying, should be required to take fine art in the sense, for example, of spending much of their time on "easel" painting. On the other hand, we are agreed that there are fundamental skills and disciplines which underlie and sustain any form of specialization in art or design and which should be learned and practised by all students throughout the course as an extension of the work already done on a pre-diploma course.'[280]

The notion of a shared base for art and design students thus evolved from Basic Design to the new DipAD courses, both in the form of a 'pre-diploma' and within the curricula the art schools had to develop in order to offer the DipAD. In 1965 an addendum was published by the Coldstream committee which clarified that the completion of a pre-diploma course did not guarantee students a place on a Diploma course.[281] One can only imagine that this was made necessary by the radical and adventurous foundation courses which evolved in the period of 1960-5, including Groundcourse, which created difficulties for central assessment.

In its contemporary incarnation, the foundation year is a general introduction to project-led work and portfolio-preparation to a standard and type which is intended to meet the needs of art schools to a level that a secondary school education cannot achieve. They are standardised to meet UCAS requirements and considered further education rather than higher education. They are something of an oddity in the academic system and while foundation courses are now available in a broad range of subjects, they are primarily designed for students who need to improve on earlier

[280] Coldstream, W. (1960) *The First Report of the National Advisory Council on Art Education.* Paragraph 12. NACAE.
[281] Coldstream, W. (1965) *Addendum to First Coldstream Report.* NACAE

grades or bridge a gap in their education. It is interesting then that the early foundation courses were varied, radical and often eccentric in the extreme. One course at Hammersmith College, attended by Freddy Mercury, was based on the writings of Karl Popper whilst including regular tutorials in contemporary improvisational dance.[282] Artist and former girlfriend of Freddy Mercury, Rosemary Pearson – now known as 'Rose Rose' - recalled that:

'We did a project on being a house fly and researched it at the Natural History Museum...this led to making installations; we did a project on being a junkie and made another installation about the effects of psychedelic drugs.'[283]

While the Karl Popper basis does not necessarily come across in these recounted exercises, the radical nature of the course certainly does. Rose Rose also commented that 'the staff saw the year as a great art education experiment', a measure of the freedom around the foundation courses as sites of pedagogical creativity.[284]

While London was home to many of the most radical foundation courses, it is important to note that Basic Design at Durham and Leeds has an impact on many of the teaching staff in London. Peter Kardia's famous teaching experiments at St Martins have been the subject of much recent interest. He taught first with Harry Thubron at Leeds and he was also vocally admiring of Ascott's Groundcourse.[285] This was recounted by Hester Westley in her chapter about Kardia's teaching in *From Floor to Sky: The Experience of the Art School Studio.* Westley makes the following claim:

---

[282] Interview with 'Rose Rose' (formerly Rosemary Pearson), who attended the course. Email exchange with the Author, August 2011
[283] *Ibid.* (2011)
[284] *Ibid.* (2011)
[285] In *From Floor to Sky: The Experience of the Art School Studio,* Hester Westley notes Kardia's admiration for Ascott's Pedagogy. (Westley, H. R., 2009, p. 42) Also see Le Grice, M. (2011) and Coghlan, N. (2009)

‘After Ascott’s course was dissolved in 1963, Kardia assumed the mantle of pioneer for a progressive approach to art education.’

This is a little misleading since Ascott moved from Ealing to Ipswich, where he taught a similarly radical and experimental version of Groundcourse from 1964 until 1967. As Westley noted, Kardia’s early experiments in art education lasted only into a second year – from 1964 to 1965 – meaning it was contemporary to Ascott’s second incarnation of Groundcourse at Ipswich. Given the influence Ascott had for other educators in London, it is important to highlight Ascott’s own pedagogy development took place far north of there in King’s College, University of Durham, in Newcastle.

ii) Roy Ascott: From Basic Design to Groundcourse

Roy Ascott studied at King’s College under Pasmore and Hamilton for three years, before becoming a studio demonstrator for a further two years. It was Victor Pasmore who secured him the post at Ealing. Ascott recalls Pasmore’s influence as vital to his own development and Hamilton’s influence of equal, if less direct, value.[286] Basic Design was in itself a foundation course inasmuch as it was for all art and design students and it was intended as a broad introduction to set them up for the rest of their three-year course. This in itself was a new development in the post-war years, driven, as previously discussed, by the need to reposition higher art education after abstraction and in light of new technologies.

For students and teaching staff, the premise of Basic Design offered both opportunities and difficulties; it was clear that the schism between secondary and higher art

[286] Sloan, C. (2012) *Interview with Roy Ascott.* September 10 2012

education was a significant one and that it was difficult to conceive of a foundation for art as it was a rapidly evolving discipline. Ascott's early work as a student has been discussed briefly by Edward Shanken, who noted Ascott's self-acknowledged debt to Pasmore:

'…Pasmore's theoretical approach to art and his agglomeration of diverse aesthetic, philosophical and scientific ideas foreshadowed the sorts of associations that Ascott would apply in synthesizing him own method.'[287]

The key inheritance here is that of synthesis; Pasmore's approach used biological form and process as a model for abstraction, forged links between art and architecture, biology and technology. While Ascott used a different model for his own pedagogy, he maintained this synthesised approach. Ascott made his first 'change paintings' in 1959 and through the early 1960S while he was a studio demonstrator at King's College (See Figures 61 and 62, below and overleaf).

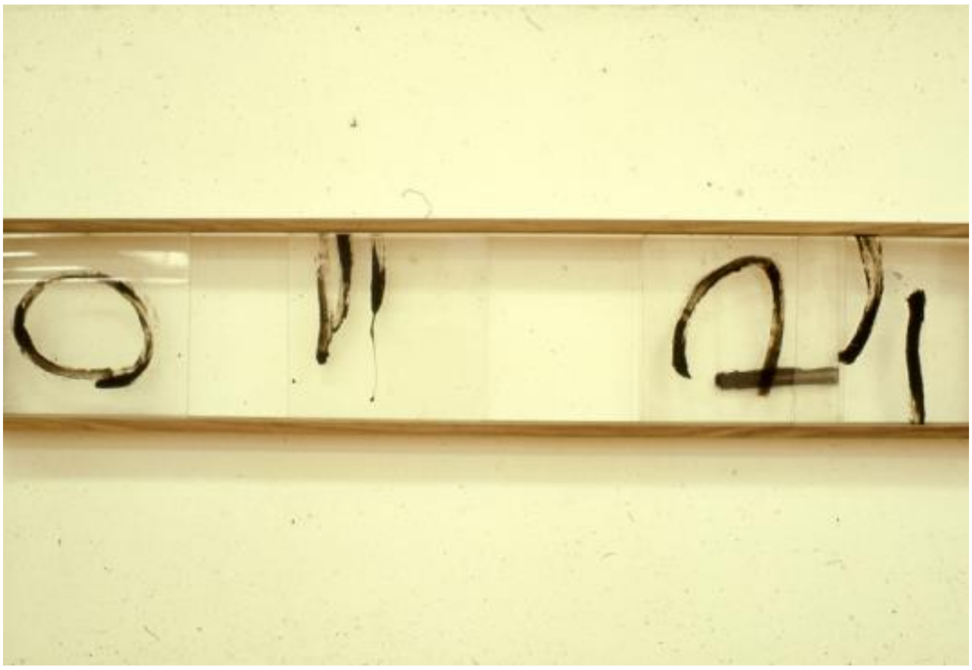


Figure 61: Roy Ascott. (1960) *Change Painting.* Wood Perspex and Paint.

[287] Shanken. *Op. Cit.* (2003) p. 9

Figure 62: Roy Ascott. (1961) *Change Painting.* Wood Perspex and Paint.

The paintings consisted of abstract marks on movable Perspex squares which could be rearranged into endless configurations, overlapped or re-ordered. Ascott sees these paintings as an essential phase in his development as they can be manipulated and therefore have the analogue qualities that dominated both his work and his pedagogy throughout the 1960s.[288] Their interactive quality turns the paintings into games, experiences, even performances. The gestural marks themselves bear a resemblance to Pasmore's demonstrations in Basic Design classes where he would do some free mark-making for his students, lines of marks appearing like ambiguous hieroglyphs. Ascott's marks have that free quality, the dripping black paint in contrast with the clean, and very contemporary, surface of the Perspex. In interview he described these marks to me as 'seeds' from which the composition could grow through the movement of the Perspex sheets.[289]

As a student, Ascott had been occupied by throwing and dripping paint in the manner of Pollock and was well-regarded within the department; Ascott recalls that 'I was

[288] Interview with the author, 10 September 2012
[289] *Ibid.* (2012)

their guy…I got Basic Design'.[290] The fact that Pasmore took him on as a studio demonstrator was a measure of this: these posts were competitive and prized as a kind of apprenticeship to teaching.[291] This is true to a large extent with Ascott; while Groundcourse was in many ways entirely original, the subject matter of cybernetics had distinct connections with the Basic Design courses at King's College.

iii) Ascott's Early Cybernetics

My retelling of Basic Design drew out the impact of early systems theories upon this pedagogical movement and explored the relevance of the collision of the biological and the technological in systems thinking of the 1950s and 1960s. In extension to this, cybernetics was a scientific theory and practice which has a legacy in systems theories - as F. H. George wrote in the introduction to his 1962 book *The Brain as Computer:*

'The title of the book, 'The Brain as a Computer', is intended to convey something of the methodology involved; the idea is to regard the brain itself as if it were a computer-type control system, in the belief that by so doing we are making explicit what for some time has been implicit in the biological sciences.'[292]

This is a direct reference to the early evolution of systems theory in the biological sciences, as covered in the previous case study. Cybernetics expanded the work of systems biologists with a more direct exploration of the human mind and body as mechanism. This is plainly related to the interactive weapons of World War II and the complex relationships between man, machine and environment which they engendered.

[290] *Ibid.* (2012)
[291] Shanken (2003) described this as a 'grooming process', with the chosen students expected to take forward their master's pedagogies into new posts which were often secured for them.
[292] George, F. H. (1962) *The Brain as Computer.* Pergamon Press. Oxford. p. 1

By 1962, Ascott's own practice presented direct references to cybernetic themes such as feedback systems and relationships between words and shapes in his self-proclaimed analogue structures such as *Video Roget* (Figure 63, overleaf). Created in 1962, the influence of Pasmore's organicism is still very much evident in the series of forms in wood. However, in a 1963 exhibition of this work at the Molton Gallery, Ascott prepared an interesting insert for the catalogue. This was a piece of tracing paper on the page before the reproduced image of *Video Roget* which was printed with a diagrammatic overlay.

Figure 63: Roy Ascott. (1962) *Video Roget.* Analogue Structure, Plexiglas, wood and glass. 50 x 35".

The overlay was labelled *Video-Roget Thesaurus 1962* and it mapped the image with the following diagram:

Metaforms for organic growth

----shift
potential

BAR--

-

flap wedge split-pitch

ART

Calibration unit
(linkage device)

Source

(goal) umbrella embryo
forming shelter growth
potential potential

womb claw holding pulse
energy
potential

STRATEGIES

ITEMS

OF INTENTION

Figure 64: Diagram of text overlay from Molton Gallery Catalogue. 1962

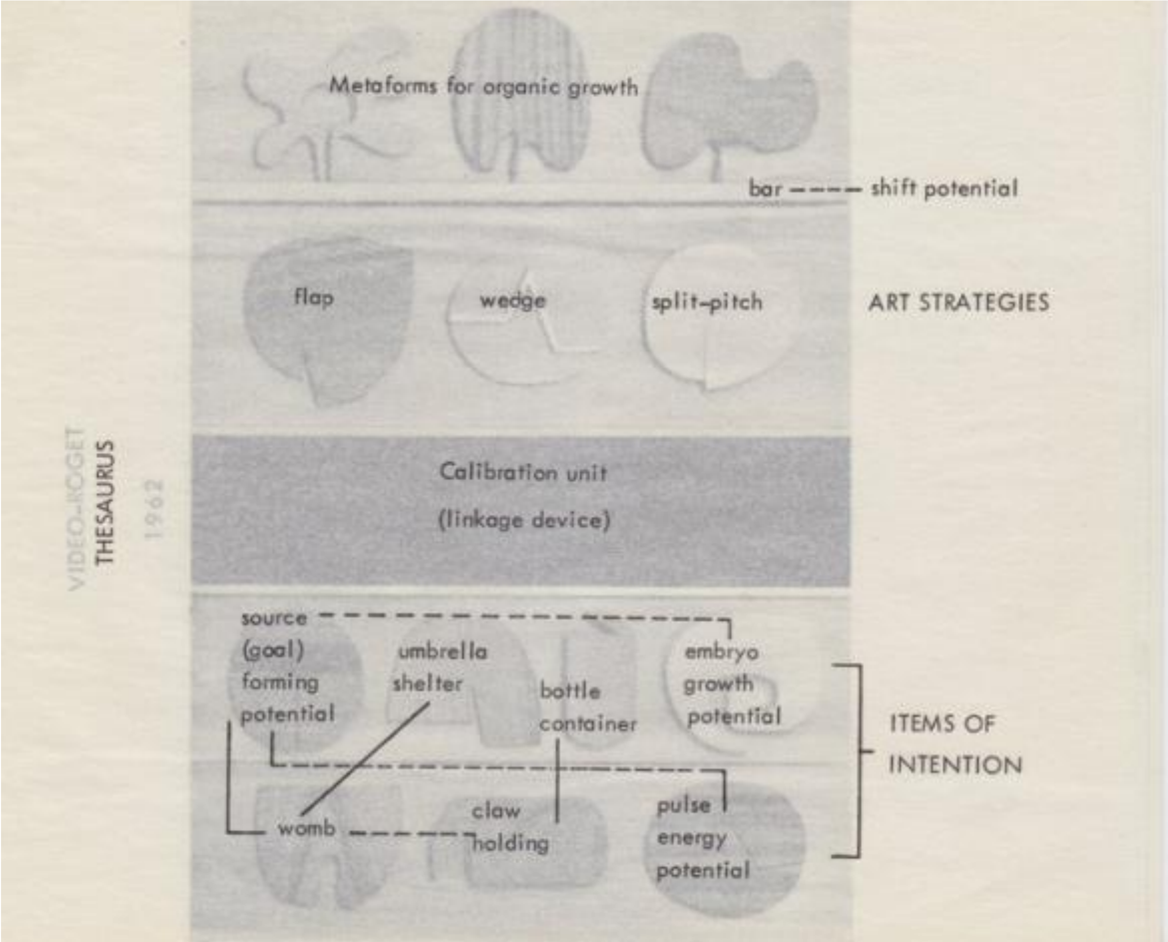


Figure 65: Roy Ascott *Video Roget.* (1962). Analogue Structure: Plexiglas, wood and glass, 50 x 35”. (from "Diagram- Boxes and Analogue Structures" catalogue, Molton Gallery, London 1963.)

This overlaid diagram corresponded with the abstract shapes depicted on the page underneath. The biological symbols became a site for interchange and growth and in many ways this work of art encapsulates the vital links between biological system theories and cybernetics. Abstract biological form was here presented as a network of possibility, underlined by the focus on birth, growth and gestation. The subtle grids of lines created exchanges between forms. On the following pages of the book Ascott provided a chart which resembled an electrical circuit which mapped Ascott's art ideology at the time. In one box, Ascott wrote:

'This thesaurus is a statement of my intention to use any assembly of diagrammatic and iconographic forms within a given construct as seems necessary.'[293]

Figure 66 (overleaf) shows this second diagram from the catalogue of Ascott's Molton Gallery exhibition, designed by Noel Forster. This double-page diagram (shown here in two halves) showed on the left the systems philosophy behind Ascott's exhibition and on the right an explicit social model for art practice, each within a networked system which included feedback loops, adaptive control and environment.

The diagram utilised networked language such as system, structure, feedback, 'hardware', control, exchange and environment. It was offered as Ascott's own model of practice for this body of work, a fully realised theory of art production, reception and change in a series of defined environments. In essence it is the same ideological approach that Ascott took when designing Groundcourse that same year. This work of art and its subsequent presentation for the Molton Gallery Catalogue serves as a physical representation of Ascott's transition from the abstraction based on systems biology of Basic Design to a cybernetic model for art practice.

[293] Ascott, R. (1963) *Diagram Boxes and Analogue Structures.* Molton Gallery. London.

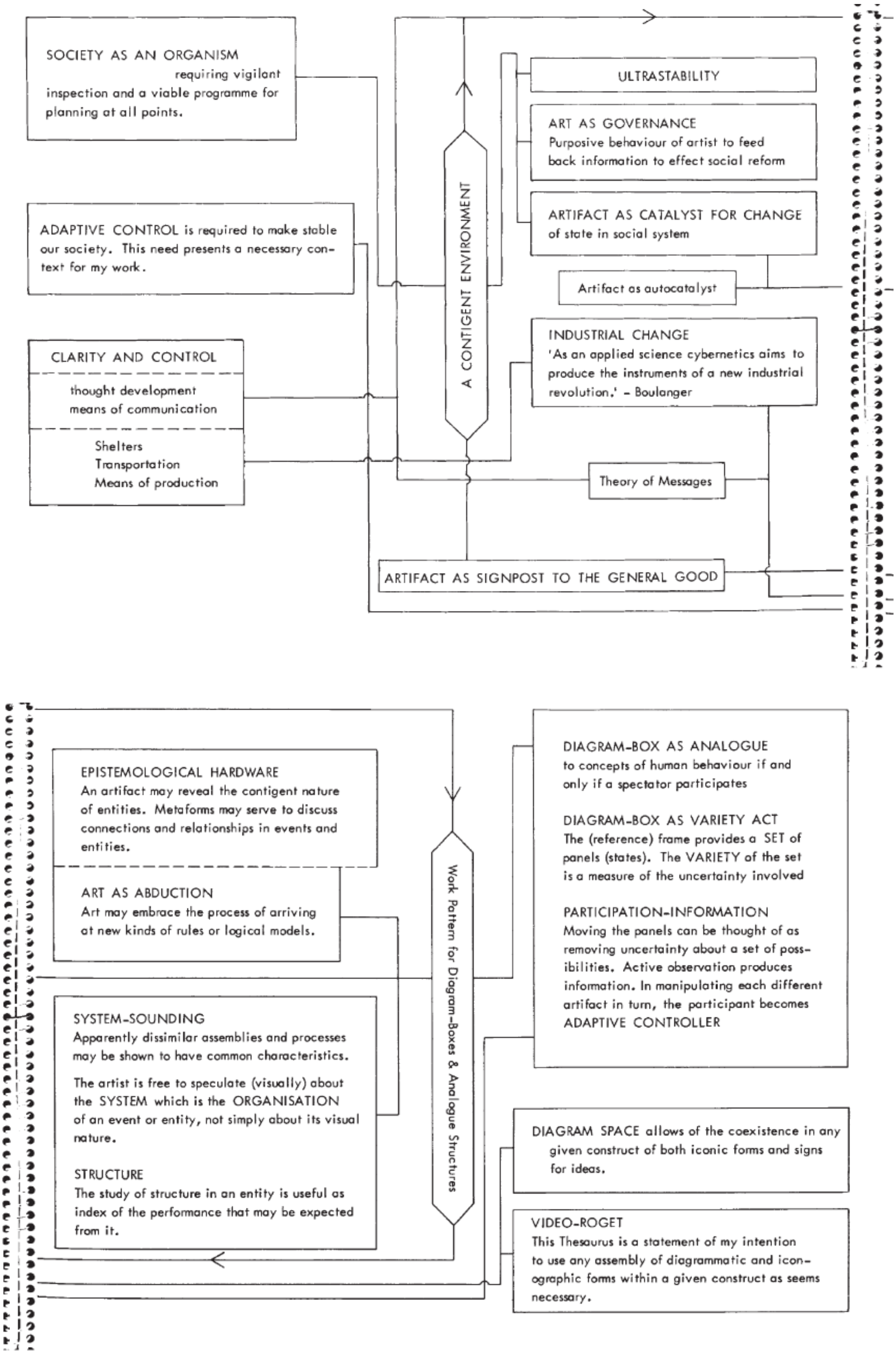


Figure 66: Roy Ascott. (1962) *Two-page diagram from the Molton Gallery Catalogue*. Illustration designed by Noel Forster.

iv) Cybernetics in Art in the Early 1960s

While by the late 1960s cybernetics approaches to art were better known, Ascott's early work was ahead of its time. Interestingly, there is little formal recognition of the active interdisciplinary work on art and cybernetics which took place in Britain from the beginning of the 1960s. In a 2011 article 'Artworld, Network and Other Alloway Keywords', Courtney J. Martin wrote:

'That Alloway's understanding of the term 'network' predated its widespread use as a description of the electronic age, and that it has since become a metaphor for all forms of interconnectivity, is all the more valuable. If Williams looked to history to situate culture, Alloway's diagnosis of the network was ahead of its time.'[294]

In this article Martin presents Alloway's use of key cybernetic terms such as 'system' and 'network' as an enduring contribution to the lexicon of contemporary art, something that evolved from Alloway's descriptions of American art of the late 1960s. She explores Alloway's development of his theory of a 'network of communications' which he concretised in his 1966 article 'Art and the Communications Network':

'Art today is distributed in a network of communications more complex though not totally different in kind from the preceding five hundred years'[295]

Alloway's use of network terminology was directed towards exploring the interacting layers of the 'artworld', his amorphous term for this networked whole of institutions, artists and audiences. What is striking about Martin's article is that the origin of the term 'network' and its contemporary technological relevance are not mentioned at all. Given the fact that many artists - Ascott included - worked directly with cybernetic language and structures in the visual arts from 1961, crediting Alloway with the integration of network and system language within the visual arts lexicon is

[294] Martin, C. J. (2011) "Artworld, Network and other Alloway Keywords". *Tate Papers.* Issue 16. 1 October 2011. Accessed Aug 2012: http://www.tate.org.uk/research/publications/tate-papers/art-world-network-and-other-alloway-keywords
[295] Alloway, L. "Art and the Communications Network. *Canadian Art.* Issue 100. January 1966. P. 35

problematic. Given the sophistication of the art 'network' offered by a young Ascott three years earlier, it is clear that network language infiltrated the visual arts over a far longer period and with far more complex connotations than the primarily social model offered by Alloway. As discussed in my previous case study, in the same issue of *Tate Papers,* Erik M. Stryker noted that both Paolozzi and Lawrence Alloway engaged with early cybernetics and systemic approaches to bodies and architecture.[296] It must also be noted that this engagement did not have the complex and thorough ideology which Ascott developed for Groundcourse.

During Ascott's formative period at King's College he fused elements of Basic Design with an entirely new level of systems awareness that owed a lot to his own military experience prior to his studies. However, Ascott's own account of his development focuses on a moment during his time as a studio demonstrator; when browsing the stacks his hand alighted upon F. H. George's *Automation, Cybernetics and Society.*[297] This was recounted by Pethick in her short article *Degree Zero* as Ascott's 'Eureka moment', when he 'came in contact' with cybernetic theories of animal and machine.[298] The notion came from Ascott himself, who is quoted by Shanken describing it as an:

'Eureka experience – a visionary flash of insight in which I saw something whole, complete, and entire'[299]

Ascott mentioned this moment in the library to me in interview as well, describing the way in which we browse libraries, the chance encounters that lead us to new

---

[296] Stryker, E. M. (2011) "Parallel Systems: Lawrence Alloway and Eduardo Paolozzi". *Tate Papers.* (See basic Design case study p. 137)
[297] George, F. H. (1959) *Automation, Cybernetics and Society.* Pergamon Press. Oxford.
[298] Pethick. *Op. Cit.* (2006)
[299] Shanken. *Op. Cit.* (2003) p. 10. Ascott quoted from an interview of 1995.

discoveries.[300] However, it is not chance which leads us to wander the stacks, nor to pause and browse the brand new scientific discipline of cybernetics – it is a desire to discover. Furthermore, the 'Eureka' moment came not from discovering a new idea but from finding a theory that encapsulated Ascott's developing interests in human communication and technologies. This may seem a simple point but it is an important one – Ascott did not lift his cybernetic practice wholesale from the texts he discovered in his last year at King's College. Cybernetic theories grew in the post-war period as a result of the new interactive technologies of World War II and the technical, moral and philosophical questions they posed for mankind's mechanical future. Ascott's early exposure to cybernetics and the symbolic presence of the Cold War in his resulting pedagogy and practice is the subject of the following chapter.

[300] Interview with the author, September 2012

2.3. Roy Ascott, the Cold War and Cybernetics as Language

Groundcourse: Behavioural Project with Calibrator. Ealing, 1963

'Given an organism, its **environment** is defined as *those variables whose changes most affect the organism, and those variables which are changed by the organism's behaviour.'*

R. W. Ashby

i) Roy Ascott and the Cold War

Ascott’s exposure to the dynamic multi-media environment of Aircraft Control was mentioned only briefly in the existing short accounts of Groundcourse. As noted, Edward Shanken offered the fullest account of Groundcourse to date, and yet he did not analyse Ascott’s development and resulting pedagogy in the context of the Cold War – this is what this chapter sets out to do. In Shanken’s biographical essay about Ascott, the subject of Ascott’s time with the Air Force is only mentioned twice, and in the context of Ascott’s slightly later practice. In the 1970s Ascott created a number of table-top works of art based upon transactions and interactions. Figure 67 (below) shows *Transaction Set* from 1971, a set-up which included a grid and a series of domestic plastic objects such as biscuit cutters, funnels and clothes pegs.

Figure 67: Roy Ascott. (1971) *Transaction Set*. Mixed Media

Shanken writes about this phase of Ascott's work that:

'…Ascott's experience as a radar officer in the Royal Air Force may have contributed to his artistic predisposition towards a horizontal bird's-eye view and the use of cartographic forms that triangulated information to predict the future.'[301]

Transaction Set clearly employs the language of Air Craft Control, from the plastic pieces to the grid, looked down upon from above. The main point of departure between Shanken and this study is the lack of weight the author gave to Ascott's Cold War experience which is clearly manifested in both his practice and his ideology. Furthermore, the technological tension the Cold War engendered was apparent not only in the covert environment of military intelligence but also in a culture struggling with a implications and concerns engendered by an increasingly mechanised environment. Shanken's reading of Ascott's development treats cybernetics and the Cold War separately and does not consider that cybernetics originated from the philosophical, psychological and practical problems which new technologies created.

Cybernetics is not purely theoretical – it evolved alongside mechanical engineering because it was a necessary layer of engagement with the issues of systems, feedback and control which sophisticated technologies presented. Its etymological root is from the Greek *(kybernētēs)*, meaning "steersman, governor, pilot, or rudder" – an indication that the core issue in cybernetics is that of controlling or giving direction to complex systems.[302] Ascott's earlier cybernetic work – as described in the previous chapter – represented a clear cybernetic understanding and the same underlying concept of pieces to be manipulated within a system.

[301] Shanken. *Op. Cit.* (2003) pp. 33-34
[302] See Oxford Dictionary Online: http://oxforddictionaries.com/definition/english/cybernetics?q=cybernetics Accessed 01/12/12

In the mid-1950s Ascott had considered training as a pilot with the Air Force. He reconsidered after he received some sage advice from a friend who told him that if he scored very highly in his exams and entered pilot training, he would be on a trainee's wages for two years. However, if he was to do moderately well in his exams he would be selected for Ground Control and would start on a full salary. Ascott pitched for moderate success by feigning air sickness and was offered a post in Aircraft Control on a full wage as hoped.[303] This laughingly recalled moment sent Ascott into an environment defined by the tension of military stand-off. At the bottom of five-storey pit, twenty men and women were positioned around a huge map of the coast and the North Sea, each individual plugged in and receiving information on screens from one of the radar control stations along the North-East Coast.

If they got a reading – Ascott describes this as 'a blip or a pulse' – they would push a small model plane into place on the map with long sticks. Three readings would be taken, each plotted on the map, before the position was triangulated and the plane was pushed into its likely location. As described in the opening of this case study, Ascott himself was positioned on the side of a bunker looking down on a map along with several others around, above and below him. Beside him, he had a stack of reports detailing the trajectory of all known flights in the area. Once a definite flight path became visible to him on the map below, Ascott would cross reference the location with all known flights in the region.

If the small plastic plane on the map below did not match any of the detailed flights for the day, Ascott immediately had to pick up the red telephone and utter the words

[303] Interview with the Author, 10 September 2012

‘Scramble, Scramble, Scramble!’ There were fighter jets on standby along the Norfolk coast and this call would immediately send them into the air on an emergency recce. There was never a real threat in the two years Ascott spent there – it was most often American pilots who had taken their girlfriends out without getting permission.[304] Ascott’s description of this static, tense environment gives an insight into the material experience of the Cold War stand-off; complex new technologies caught in a symbiotic relationship with this analogue world of plastic pieces. The Cold War years saw an urgent rush to harness and develop these new technologies in an atmosphere of tense secrecy. Ascott worked in this atmosphere, where the tension of possibility was played out on several levels.

ii) Ground Control as Visual Environment

Within Ascott’s job there were two layers of analogue activity. The first was the analogue computers which provided the radar information on the screen, creating the interface between environment, humanity and machines upon which cybernetics was built. Ascott described this as ‘a multi-media environment’ and commented that:

> The environment was absolutely wonderful…a lot of electronic displays, I think octagonal… as I recall you’d see glass windows and people doing different stuff. Goodness knows what! These displays, as you can imagine, showed everything you would need to know about and the Northern Sea…’[305]

There is a filmic quality to this description - a highly visual environment of cutting edge technologies and game-like displays, of known and secret talks taking place behind glass. The architectural environment of the bunker, its open spatial arrangement with its layers and zones, meant that different activities within the space were visible

---

[304] *Ibid.* (2012)
[305] *Ibid.* (2012)

but not fully understood – like the silent meetings going on behind glass. The architectural space thus echoed the broader tension and secrecy of the situation – everybody within that environment could view each other but their specific tasks and instructions were not necessarily understood. Information was controlled. Job function was controlled and limited to need. The environment was networked, systemised and mechanised. This has clear relevance to Ascott stating that he wanted to 'Look at this two year course as an organism and as an organism it would have rules…'[306] This notion will be explored more fully in the next chapter but it is worth noting the parallel between cybernetics and pedagogical system as organism.

Another kind of analogue activity also has vital relevance to Ascott's pedagogy and practice; this was the physical environment of Ground Control, where the plastic aeroplanes were analogues for the real and - possibly threatening - planes that could have been heading to our shores. This was a world of simulacra, where a coloured, toy-like plastic piece symbolised a potential enemy. As noted, the discipline of cybernetics arose from this complicated new environment where exchanges of real information took place between mankind, machine and environment. As Paul N. Edwards writes in *The Closed World: Computers and the Politics of Discourse in Cold War America:*

'Both the engineering and politics of closed-world discourse centered around problems of *human-machine integration:* building weapons, systems and strategies whose human and machine components could function as a seamless web, even on the global scales and in the vastly compressed time frames of superpower nuclear war.'[307]

[306] *Ibid.* (2012)
[307] Edwards, P. N. (1996) *The Closed World: Computers and the Politics of Discourse in Cold War America.* MIT Press. Massachusetts. p. 2

Edwards highlights the key aspect of the Cold War military experience – individuals were part of a fast-functioning system. They were components of this system in the same manner as the integrated computers, vehicles and weapons were. Moreover, this integrated system had to be efficient because of the swift devastation which could be wrought by nuclear warfare. The pilots waiting in their fighter jets on the coast of Scotland, ready to launch at Ascott's word, were there so that any threat could be met as swiftly as possible. Edwards explored both the systems qualities of the Cold War military in the USA, and the evolving cultural symbolism of cyborgs, robots and the computerised mind that it provoked. The cultural trope of the cyborg was one way in which the anxieties and wonders of the cybernetic age could be explored – the same issues which Ascott used to create a pedagogical model.

In *The Brain as Computer,* F. H. George listed the general aims of Cybernetics as follows:

'(l) To construct an effective theory, with or without actual hardware models, such that the principal functions of the human organism can be realised.

(2) To produce the models and theory in a manner that realises the functions of human behaviour by the same logical means as in human beings. This implies the simulation of human operations by machines, whether in hardware or with pencil and paper.

(3) To produce models which are constructed from the same colloidal chemical fabrics as are used in human beings.'[308]

One of the key figures in the development of a coherent theory of cybernetics, George makes clear the biological premise of computer development – to produce machines which could mimic the high function of the human brain. The enduring science-fiction narrative device of robotic takeover stemmed from this collision, in the mid-twentieth

[308] George. *Op. Cit.* (1962)

century, of biology and technology as embodied by the quest for a kind of blueprint for human cerebral processes.

iii) Cybernetics, Systems and Social Organisms

Another book of the same period, W. Ross Ashby's *Design for a Brain* of 1960, examined cerebral process as a systems problem, particularly the issue of self-co-ordination and systems boundaries. Writing on the subject of the environmental boundaries of any given system, Ashby wrote that:

'As the organism and its environment are to be treated as a single system, the dividing line between 'organism' and 'environment' becomes partly conceptual, and to that extent arbitrary.'[309]

This statement has clear correlations to the technologies of the post-war world, the integrated systems of human and machine components which Edwards described above.[310] Ashby continued:

'Once this flexibility of division is admitted, almost no bounds can be put to its application. The chisel in a sculptor's hand can be regarded as a part of the complex biophysical mechanism that is shaping the marble, or it can be regarded as part of the material which the nervous system is attempting to control. The bones in a sculptor's arm can be similarly regarded either as part of the organism or part of the 'environment' of the nervous system. Variables within the body may be justifiably regarded as the 'environment' of some other part.'[311]

This very relevant passage demonstrates the way in which the human mind and body is networked with its wider environment, each process or exchange linking on to another in a potentially endless system. While this argument can be interpreted in the context of longer-standing philosophical discussions of the mechanistic world view, it had far greater contemporary relevance in its Cold War context. Ascott's first

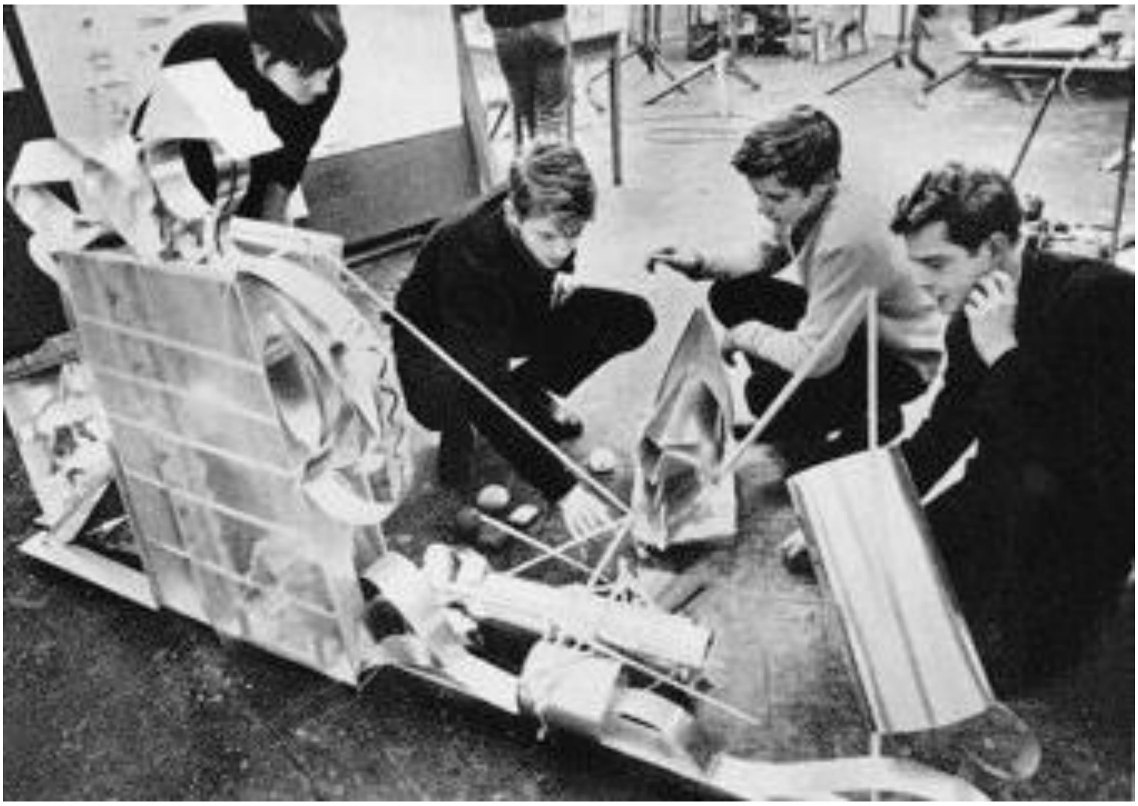
[309] Ashby. *Op. Cit.* (1960) p. 4
[310] Edwards. *Op. Cit.* (1996)
[311] Ascott. *Op Cit.* (1960) p. 40

cybernetic text was F. H. George's *Cybernetics in Management*, which he recalled as being full of 'lots of words in bold like retraction, black box, feedback'.[312] The language delighted him, and he found he was developing not only a cybernetic vocabulary but also a set of ideas which had practical – and visual – possibilities. Ascott decided then, that the two year course at Ealing was going to be a 'dynamic system' in its own right, an organism of sorts as previously noted and as an organism it would have certain physical rules. These rules derived from a cybernetic concept of organic systems, such as mutual reciprocity (if you receive information you must also share information) and requisite variety (difference creates more information than similarity can).

As stated, the set of concepts which Ascott gleaned from cybernetics were not only to become a kind of language for students to investigate but also a structure within which both students and staff would operate. Thus the course itself operated as a total concept from structure and philosophy to process and symbolism, something without comparison in its time or since. While the various permutations of Basic Design had each developed a total curriculum of form, the pedagogy itself lacked this self-reflexivity, since it was structured around the assumption that a basic language of form could be pinned down and taught. Groundcourse, on the other hand, abandoned this predisposition and thus anticipated the gradual conceptualisation of art training over the following two decades.

[312] Sloan. *Op. Cit.* (2012)

2.4) Groundcourse: Behaviourism, Organicism and Structure



Groundcourse Students work on Analogue Machines. 1965. Ealing.

i) The Philosophy of Groundcourse

In 1963 Ascott arrived at Ealing College with a fully conceived programme for Groundcourse. In an educational context, to give a grounding has the same meaning as to provide a foundation. However, the name of the course also reflects its cybernetic content in that it recalls "Ground Control", the environment which generated early cybernetic theories. Ascott's extraordinary curriculum sought to disrupt the concept of art education which students had experienced at school and to strip back any preconceptions about the subject. Much like their Basic Design predecessors, Ascott and his staff used surprises and disruptions to achieve this, amongst other tactics.[313]

However, while Basic Design practitioners made formal interventions such as tearing up and reconstituting student work, in the context of Groundcourse exercises were designed to disrupt process and to encourage questioning from the outset. Furthermore, Groundcourse brought a new environmental awareness to the students within the art studio, essentially turning even media-led exercises into performance. This section seeks to reconstruct and interrogate Ascott's pedagogical model within its broader cultural context of post-war technologies. The material examined here includes Ascott's own writing and photographs from the period as well as new material from an interview conducted with Ascott on September 10 2012.

[313] Ehrenzweig discusses the 'disruptive' strategy in Basic Design in his unpublished essay: Ehrenzweig, A. *Psychological Factors in Teaching Basic Design.* Unpublished draft typescript. William Johnstone Archive, National Library of Scotland Dep. 332/6

In his 1964 article *The Construction of Change*, Ascott gave an overview of exercises and approaches in the Groundcourse curriculum.[314] First giving an account of the interrelationship between art and cybernetics, Ascott then outlined his pedagogy. He writes:

'The first-year course has many facets. Empirical enquiry in response to precise questions is balanced by scientific study; irrational acts by logical procedures. At the core is the concept of power, the will to shape and change. Cybernetics and behavioural sciences are studied regularly.'[315]

The pedagogy of Pasmore and Hamilton is expressed here to an extent; particularly in the binaries created between empiricism and scientific study (Hamilton) and the logical and the irrational (Pasmore). However, the underlying behaviourist focus – power as a kind of creative currency - was particular to Ascott in this period. In addition, both the methods and the outcomes of Groundcourse were radically different from Basic Design.

ii) Analytical Drawing, Cybernetics and Behaviour

A good measure of the distance between the two pedagogies can be found in analytical drawing exercises described by Ascott:

'Example 1. Analyse and dissect a section of pomegranate. Discuss with precise drawing its three-dimensional cellular structure. 2. Examine a plant in minute detail; design a new plant based on the principles of growth you have observed. 3. Discuss visually the movements of a hungry, caged lion; then those of a frightened squirrel.'[316]

[314] Ascott, R. (1964) "The Construction of Change. *Cambridge Opinion 41 (Modern Art in Britain)* pp. 37-42. 1964.
[315] *Ibid.* p. 39
[316] *Ibid.* p. 41

Aside from the first conventional analytical exercise these tasks each involved an element of surreal speculation - Figure 68 (below) demonstrates the surreal outcomes which Groundcourse analytical exercises created:

Figure 68: Anon: Student of Roy Ascott. (1965) *Groundcourse Analytical Drawing.* Ipswich.

At the base of the drawing, there are notes by the student about the relationship between the advertiser and the consumer and what the advertiser must take into consideration in communicating with the consumer. The student writes ‘The visual image portrays the relationship between the advertiser and the consumer’ and also comments that ‘advertisers must take into consideration environmental media’. Connecting this dialogue on advertising with the resulting image is difficult, but it could be an exercise in exploring ‘visual environment’, for example. This exercise has a clear focus on controlled communication and the analysis is directed more towards assessing the way an advertiser must understand their market and target their campaign accordingly. This had connotations of psychological manipulation and control which was in keeping with the broader behaviourism which shaped Groundcourse. There were clear behavioural undertones in this analytical drawing exercise and others – such as those in which students tried to depict the angry or startled movements of animals in different environments as described above.

This exercise has interesting parallels with the Pop Art exercises incorporated into Basic Design by Hamilton and Paolozzi. Basic Design classes encouraged students to use the increasingly sophisticated advertising imagery of the late 1950s and early 1960s to collage, construct and question the semiotics of the branded image. British Pop Art itself had highly developed cybernetic resonances, a fact that has been much overlooked in terms of its art historical reception. Hamilton's collage for the *This is Tomorrow* exhibition in 1956, *'Just What is it That Makes Today's Homes so Different, So Appealing?'* (Figure 69, overleaf) is a good early example of this. This highly branded world of domestic life is dominated by the appliance, including a vacuum cleaner, a tape recorder and a television set. Each of these objects epitomise the broader cybernetic issue of interaction between man and machine within a wider environment.

Figure 69: Richard Hamilton. (1956) *Just What is it That Makes Today's Homes so Different, So Appealing?* Collage. Kunsthalle Tübingen.

In the post-war years, appliances such as vacuum cleaners stopped being luxury items and were widely purchased by the fast-growing middle classes. Thus the boom years also saw appliances move from a rarity to the norm, as simultaneously the working world became mechanised too. It is important to note that the incorporation of machines and appliances into everyday life increased beyond anything experienced before in this era. Interestingly, it is Hamilton's pedagogical approach at King's that most clearly demonstrates his reverence for the machine, which at this early stage in his career, far exceeded his interest in the polished fantasy world of the advertised product. The analytical exercises reviewed in the previous section are in many ways the best measure of Hamilton's fascination with the mechanisms of contemporary life, from juice squeezers to change balls.

Ascott certainly drew from the Basic Design curriculum, but his approach of analysing advertising semiotics was quite different. The student work in Figure 67 explored the complexities of communication within a broader visual environment, as well as exploring advertising as a kind of objectively controlled visual medium. It was not the imagery but rather the conscious manipulation of the consumer that was the focus, in keeping with the behaviourism which defined the course. In order for young students to engage with such radical approaches, teaching staff first had to attack their existing ideas about art practice.

iii) Reprogramming Students: Behaviourism in Teaching Practice

John Bonehill, a former Groundcourse student at Ealing College, recalled one of his first classes at the college, taught by Denis Bowen:

> He…said 'from now on you will forget everything you ever learned about art, no more blue skies and green trees for you'. We each were given a block of black wax and three sheets of brown paper and we were to spend the first day 'Brass Rubbing' our way around campus, getting rid of our preconceptions.'[317]

As outlined by Ascott, the first years were to be challenged on their preconceived notions of visual art practice. Bonehill himself turned up for the first day of Groundcourse in his school uniform – a fact that is perhaps a good measure of the leap to be taken from a 1960s comprehensive to a radical art training.[318] Bonehill's

[317] Sloan, C. (2011) *Email Exchange with John Bonehill*. July 2011.
[318] *Ibid.* (2011)

recollections of Groundcourse focus on these moments of shock as well as the personal liberation prompted by the subsequent inventions, processes and experiments. The behavioural focus of the course was taken even further in other exercises in which a disruption of process in the manner of Basic Design was applied to a Cybernetic theme:

'1. Draw a man, machine or animal. Cut up the drawing into seven sections (e.g. arm, head, wheel, handle, etc.). Put the pieces with everyone else's in a box. Pull out another seven at random; logically construct a new entity. Draw the environment in which you might expect to encounter it.'[319]

Ascott describes this as an exercise in 'behaviour, environment and identity'. The resulting drawings would have been a series of collaged cyborgs not unlike the assembled heads and bodies taught at King's College in the manner of Paolozzi. However, Ascott took the theme further by introducing the element of chance and then leading the students towards considering, once again, the way something might live in a given environment. In another exercise, students were told to:

'Invent a typewriter-bird and show the kind of tree within which it could most successfully hide'[320]

While there is an element of fun here, the underlying message is clear – living things and machines adapt to their environment and are suited to it. To understand any organism or any machine, one must also understand its environment. This message was repeated throughout the first year curriculum, and emphasised further by exercises which focused on systems awareness too. On the subject of designing – or programming – adaptive systems based on the human brain, W. Ross Ashby wrote:

---

[319] Ascott, R. (2003) Telematic Embrace: Visionary Theories of Art Technology and Consciousness. Edited with an Essay by Edward A. Shanken, E. Berkeley: University of California Press. p. 41
[320] *Ibid.* p. 41

'I hope to show that a system can be both mechanistic in nature and yet produce behaviour that is adaptive. I hope to show that the essential difference between the brain and any machine made yet is that the brain makes extensive use of a method hitherto little used in machines. I hope to show that by the use of this method a machine's behaviour may be made as adaptive as we please, and that the method may be capable of explaining even the adaptiveness of Man.'[321]

Ashby's aim was that at the heart of cybernetics – to understand and even model the complex function of the human brain so that the application of the same systems could be used to create machines with 'adaptive behaviour'; thinking machines. Whereas the analogue machine echoed a situation precisely, the thinking machine would have to be adaptive, deductive and self-managing – the precise development since achieved by digital technologies.

'Create a world on paper with major and minor structural systems', writes Ascott in his pedagogical notes, 'Show a fault occurring in the minor one; design a repair centre to put it right'.[322] This highly conceptual drawing exercise clearly reflected the cybernetic texts in which Ascott had been so immersed but it also explores the basic principle of systemic interconnectivity – the sub-systems which feedback into the whole. This goes beyond the biological and environmental roots of cybernetics and engages directly with cybernetics as an emerging theoretical model. The students were thus made to focus on a very abstract notion – the interrelationship and mutuality of abstract dynamic systems. It is important to note that this kind of pure systems thinking was at the cutting edge of both the philosophy of science and of technological development of the age.

[321] Ashby. *Op. Cit.* (1960) p. 1
[322] *Ibid.* p. 41

Interestingly, the set of ideas which was introduced gradually through drawing and making in the first year then became a total environment in the second year, a conceptual art education like no other in that era. Ascott saw the first year as an absorbing series of problems demanding 'total involvement' from the students, and then:

'In the second year the situation changes radically. The general direction is programmed but beyond that students must find their own problems. Students are set the task acquiring and acting out for a limited period (ten weeks) a totally new personality, which is to be narrowly limited and largely the converse of what is considered to be their normal "selves". They design "calibrators" to read off their responses to situations, materials, tools and people. They equip themselves with handy "mind-maps" for immediate reference to their behaviour pattern as changes in the limitations of space, substance and state occur.'[323]

The specifics of these second year exercises will be reviewed within the following pages, along with a number of other first year exercises which took the students further into the interconnected world of cybernetic theory.

iv) Cybernetic Interactions: Aircraft Control and the Analogue

This section deals with one of the key concepts employed within Groundcourse – that of the analogue machine. The analogue machines of Groundcourse will be read in the context of the wider technological shift taking place in the period; from the analogue to the thinking machine. The significance of using the term 'analogue' for an art object will be discussed and contemporary examples of analogues used to build a fuller account of the significance and potential of the term within an art school context. In addition, this section will seek to draw out the place of Ascott's Air Force training in the development of this unique collision of technological terminology and creative

[323] Ascott. *Op. Cit.* (1964) p. 42

pedagogy. There is a necessary element of visual comparison in this section; the best possible demonstration of the ways in which post-war technologies infiltrated the material culture of the art school is to see examples side by side.

The term 'analogue' evolved from the Greek *analogos*, meaning proportionate.[324] The technologies of World War II – including radars, gun control and missiles – used analogue computers. These computers used sensors, thermometers and other reading equipment to measure factors including the current temperature, speed, distance and wind conditions, which assisted with the optimum deployment of weapons. They were mechanical systems; in the post-war years these mechanical systems were replaced with electronic systems. The information was proportionate – analogous - to the situation. In contemporary times, 'analogue' is most broadly used as a counterpoint for digital, particularly with reference to clocks; the hand that points at a number versus a digital display. In many ways this is as apt an example for the analogue/digital difference as any. The mechanism of the clock represents in a concrete way the passing of time, the hands marking out each second in an analogous movement. The analogue mechanism reflected in a physical way, the information which it measured.

Within the context of Groundcourse, analogues, objects and machines were creative outcomes, most often posed as a means of reflection or summary within a project. To use the term 'analogue' for art objects was to create a conceptualised or symbolic meaning; each object analogous with a meaning, idea or experience. There were a

[324] Oxford Dictionary online, accessed 28/10/12: http://oxforddictionaries.com/definition/english/analogue

number of exercises geared towards the creation of analogue mechanisms as part of Groundcourse, such as Figure 70 (below):

Figure 70: Anon. (students of Roy Ascott). (1965) *Groundcourse Analogue Structures*. Ealing.

While visually there are obvious links to the kinetic sculpture exercises which were part of the Basic Design curriculum, the new terminology reflects the element of physical manipulation or interaction. Kinetic sculpture needs energy in order to move, whether this is wind, water or the human hand. Kinetic means *motion* and analogue means *proportionate;* one relies on physical forces for movement, the other measures changes of set conditions by mirroring physical forces. That is, an analogue machine is intended to measure information against a known quantity. Differential Analysers, the earliest of which dates to 1878, were mechanical analogues which solved equations by integration (see Figure 71, below).

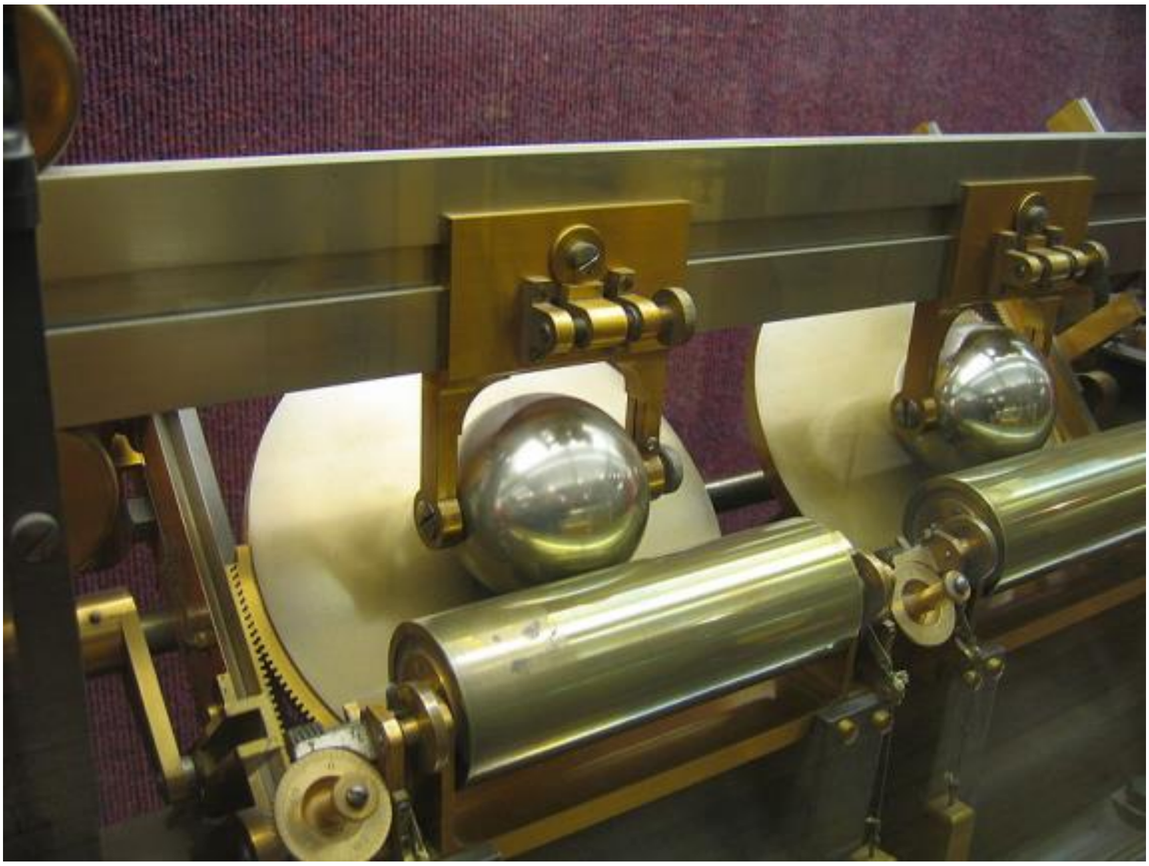


Figure 71: Anon. (1878) *Disk and Sphere from Lord Kelvin's Harmonic Analyser*.

Lord Kelvin's harmonic analyser analysed daily changes in atmospheric pressure and temperature. The tracing point was taken along the curve to be analysed and the movement caused the disks to rotate which in turn caused the rolling spheres to communicate the motion to the recording cylinders. The machine was designed to replicate the movement of the traced line through the mirroring tilting motion of the ball and sphere which thus recorded the information. An analogue is thus proportionate to the information which it records.

A technological shift occurred during the war in the gradual introduction of analogue machines or engines which could perform a given function without a pilot having to physically manipulate it – radar was one of the most essential new technologies. Developed first due to the fear that the Germans were attempting to create 'death rays', it was concluded that the best use of radar would be to identify planes. Radar information could be transmitted onto a screen as described in the earlier chapter: an analogue computer where information was continuously updated to match the continuous flow of information.[325] This was a move from the individual pilot judging and measuring his situation to a complex interface between pilot, analogue and situation. Mechanical analogues evolved from the very simple analogue slide rules such as Figure 72 (below).

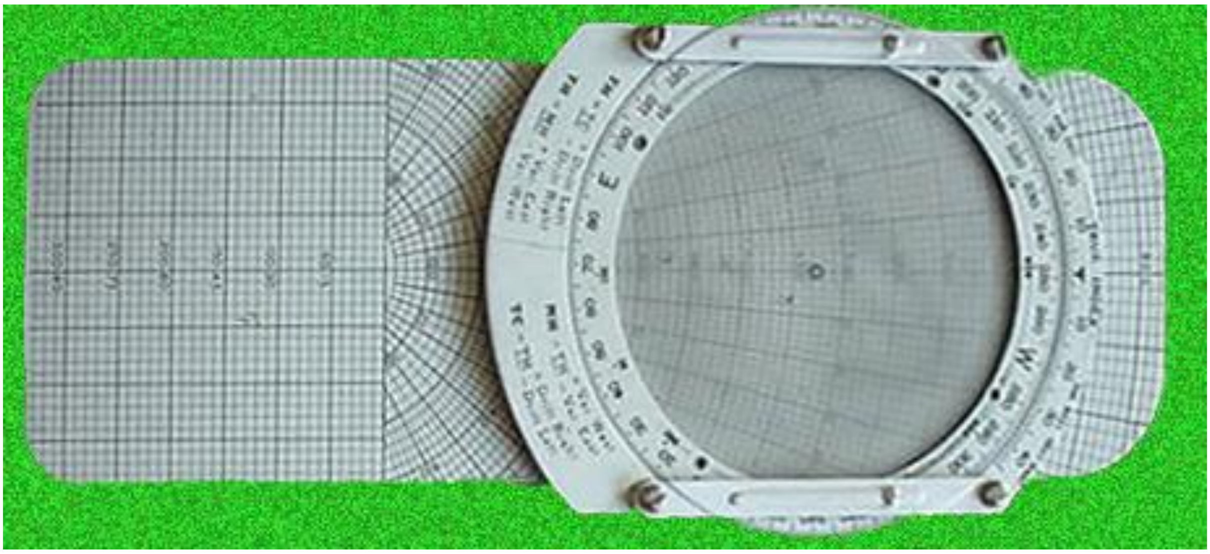


Figure 72: Pilot's Slide Rule

This object is still used in the training of private pilots today; a hand-held computer or calculator, with speed and height on one side and a tactical grid on the other with a

[325] See Basic Design case study pp. 116-123

vector triangle of heading, wind and track. This small object relied on the pilot using a known previous position to calculate a current position with the known factors of speed and direction and thus the pilot manipulates the object to be analogous to the situation. The pilot would move towards a target based on previous intelligence. As Ascott worked in Aircraft Control he would have been familiar with this object. However, the way they were used within the Groundcourse curriculum gave them an entirely different function.

These hand-held analogue calculators make a striking parallel to the so-called ‘calibrators’ created by Groundcourse students. Figures 73 and 74 (overleaf) show one such calibrator created at Ealing in 1963 - marked ‘Calibrator of Human Characteristics’ it is a hand-held circular slide-rule. The detail shown in Figure 73 shows a range of human traits, characteristics and habits which can be adjusted with the sliding mechanism:

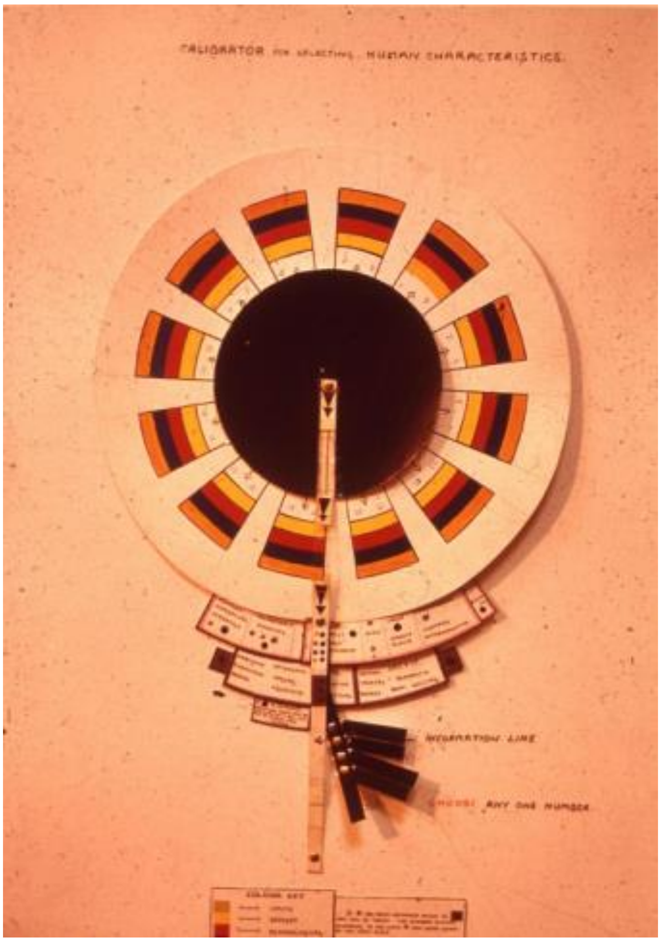


Figure 73: Anon: Student of Roy Ascott. (1963) *Calibrator.* Groundcourse. Ealing.

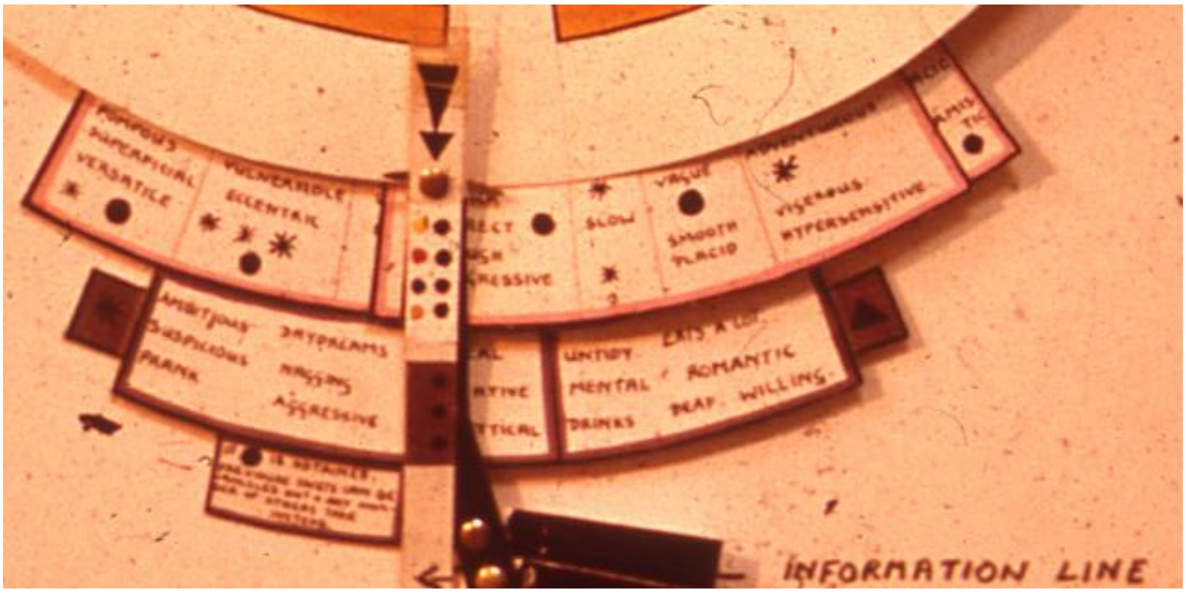


Figure 74: Anon: Student of Roy Ascott. (1963) *Detail of Calibrator*. Groundcourse.

Ealing.

The bottom tabs list the following possible traits:

‘ambitious, daydreams, suspicious, nagging, prank, aggressive, untidy, mental, eats a lot, romantic, drinks, deaf, willing, pompous, superficial, versatile, vulnerable, eccentric, slow, smooth, placid, vague, vigorous, hypersensitive.’

From Ascott’s pedagogy notes, he describes these calibrators as a tool to ‘read off responses’ to a given situation. To operate a pilot’s slide rule, the pilot must first know basic information such as point of departure and speed, which can then be measured against readings taken from the new situation. In the case of a personality calibrator, the student would be able to measure their new response to a given situation against the basic information of their natural responses, allowing them to remain ‘in character’. The art object itself was therefore part of a wider conceptual exercise which was extremely experimental for its era, treating art practice as a web of image, language and communication which the student artists had to negotiate.

In order to operate their calibrators, students were instructed to create ‘mind maps’; diagrams which would confirm their likely responses and reactions:

‘Making mind maps to get the students to think about what it was like to be a human being in a given environment stuff…I had an ulterior motive which was to really to get them to reconstruct, to re-think themselves. By then we’d worked for a year on getting rid of pre-conceptions then “what about you?” You are all these possibilities.’[326]

Thus according to Ascott the mind map exercise was not geared towards the acquisition of a new, fixed identity. This is something Emily Pethick recorded, writing that the exercise resulted in students ‘acting out a new personality contra to their own

[326] Sloan, C. L. (2012) *Interview with Roy Ascott.*

for ten weeks'.[327] The following year, Michael Bracewell quoted Pethick verbatim in his own account of Groundcourse, concretising the idea.[328] It appears to derive from Ascott's own description of the exercise in *The Construction of Change:*

'Students are set the task of acquiring and acting out for a limited period (ten weeks) a totally new personality, which is to be narrowly limited and largely the converse of what is considered to be their normal "selves"…'[329]

Ascott was clear to clarify this in interview – far from encouraging students to develop fixed new identities, he wished instead to open up their responses and create possibilities. While it was important that the students abandoned their previous reactions, the potential for variety in conceiving a new set of limitations was endless. Ascott states:

'It's been misunderstood by some people, that you had to take on an identity, a fixed identity but it wasn't like that at all.'[330]

This experiment in identity was intended to make students aware of the possibility of adjusting their own behaviour and thereby altering the outcome of any given situation. The mind maps and calibrators were thus part of the same experiment, a combination of environmental, physical and psychological processes to be explored. They had to contain a full range of options so that they could be adjusted analogously with the situation, including environment, action and reaction. Figure 75 (overleaf) is a student mind map from Ealing in 1963. The student had made the following note in pencil: 'Communication structure of 1 member within 7'. In the second year curriculum, Ascott placed the students in groups:

[327] Pethick, E. (2006) "Degree Zero". *Frieze Magazine.* Issue 101. Sept 2006. Viewed online 01 October 2011: http://www.frieze.com/issue/article/degree_zero/
[328] Bracewell. *Op. Cit.* (2007) p. 196
[329] Ascott. *Op. Cit.* (1964) p. 105
[330] Sloan. *Op. Cit.* (2012)

‘They form groups of six. These sexagonal organisms, whose members are of necessity interdependent and highly conscious of one another’s capabilities and limitations, are set the goal of producing an *ordered entity* out of substances and space in their environment.’[331]

While this student was evidently in a larger group, the image is a fascinating insight into the mode of thinking Groundcourse provoked from its students. The drawing clearly resembles an electrical circuit, although its subject is the interconnected dynamic of a group of students. Interestingly, the work retained something of the aesthetic sensibility of abstraction with its soft blocks of watercolour:

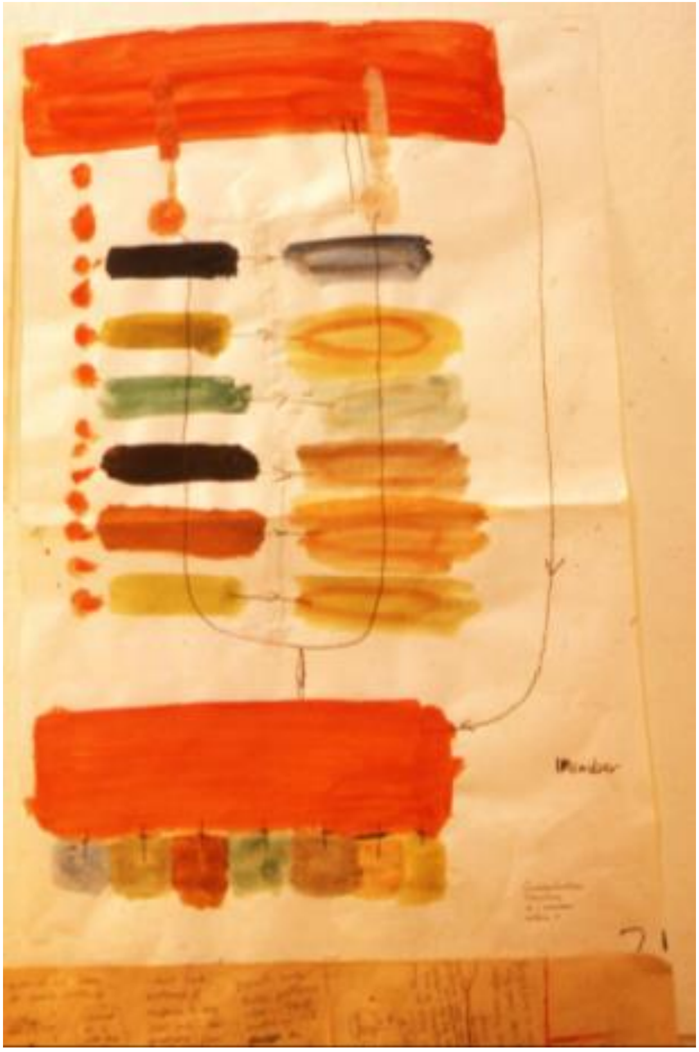


Figure 75: Anon (Student of Roy Ascott). (1963) *Mind Map.* Ealing.

[331] Ascott. *Op. Cit.* (1964) p. 42

When taking into consideration the youth of the participants, the analytical and conceptual content of their work is quite startling. The drawing reflects an interactive participation which led students to consider the dynamics of human interaction and their own habits and customs within it, while incorporating symbolic language with a clear cybernetic – or more broadly, technological – underpinning. These exercises were innovative within a pedagogical context but they were also on the very cutting edge of contemporary practice. The group of artists who taught with Ascott at Ealing, including Steve Willats, R. B. Kitaj and Bernard Cohen contributed to what was pedagogy without parallel in the twentieth century. Systems theories were essential to the development of cybernetics as they introduced the idea of organisms operating within wider systemic contexts which needed analysis. These mind maps are as biological as they are technological – and they mark a neglected and essential aspect of the development of modern technologies.

v) Organisation as Organism

The Groundcourse investigation of organisation as organism has a clear trajectory from the systems theories which were so evident within the Basic Design movement discussed earlier in this chapter. That cultural processes could be perceived as, or compared to, a kind of complex ecology was a concept which evolved alongside systems theories, principally in anthropology. In 1955 the anthropologist J. H. Steward wrote that:

> 'Analogies between cultural and biological evolution are also alleged to be represented by two attributes of each: first, a tendency towards increasing complexity of forms and, second, the development of superior forms, that is, improvement or progress.'[332]

[332] Steward, J. H. (1955) *Theory of Cultural Change: The Methodology of Multilinear Cultural Evolution.* University of Illinois Press. Illinois. p. 12

His interwar work on the notion of cultural ecology was eccentric for its time but it gained greater contemporary relevance in the post-war years. In *Theory of Cultural Change: The Methodology of Multilinear Cultural Evolution*, he presented an extended argument which compared social and cultural structures to biological form:

‘Just as simple unicellular forms of life are succeeded by multicellular and internally specialised forms which have distinctive kinds of total organisation, so social forms consisting of single families and lineages are succeeded by multifamilial communities, bands, or tribes, and these, in turn, by state patterns, each involving not only greater internal heterogeneity and specialization but wholly new kinds of over-all integration.’[333]

The concept of cultural/creative ecology has in the intervening years become a familiar one, an apt metaphor to express the complex reactions and interactions that lead to cultural development. Noting that cultural evolution had long been abandoned as an old-fashioned concept, Steward positioned his work against other anthropological studies which utilised the same methodological approach; principally V. Gordon Childe and Leslie White.[334] However, it can be better understood in the context of the post-war environment – Steward himself noted that the previous two decades had seen a resurgence of interest in the previously maligned idea.[335] The underlying organicism offers a striking parallel in the context of Groundcourse, as Ascott presented his integrated pedagogy as an organism in itself. The interactive element of the pedagogy was a key principle for Ascott, who recalls:

‘Cooperation, participation was important…The next thing was let’s design a machine and build it, a machine that would enable you to relate to what’s happening out there to what you do – the environment and your behaviour that you could use. So what would be the variables? They’d go to their mind map and the mind map would say feeling is important, logic is important whatever way they saw the world.’[336]

[333] *Ibid.* p. 16
[334] Steward. *Op. Cit.* (1955)
[335] *Ibid.* (1955) p. 12
[336] Sloan. *Op. Cit.* (2012)

Student cooperation was important for the very reason that Ascott viewed the course in its totality as an organism, so every part/person/object played a part in its total function. There are a few important points to underline here with regards to systems approaches to pedagogy. Firstly, the notion of networked, participatory function was a new development in post-war society, and the same period saw the development and growth of both the above mentioned anthropological concepts of cultural evolution as well as the theoretical area of 'organisational science'.[337] Ascott's conception of the course was that of a total system in which students and staff reacted to the material and environmental limitations and possibilities around them. Organisational Science treats an organisation or group activity as a networked whole, examining the role of specific groups and individuals in order to assess efficiency and maximise potential.

vi) Analogue Machines and the Social Organism

An interesting example of the systemic qualities of Groundcourse exercises can be found in artist and former Groundcourse student Stephen Willat's sculpture *Colour Variable No. 3:*

[337] See the Basic Design case study for a discussion of System Theory and Organisational Science, pp. 65-66

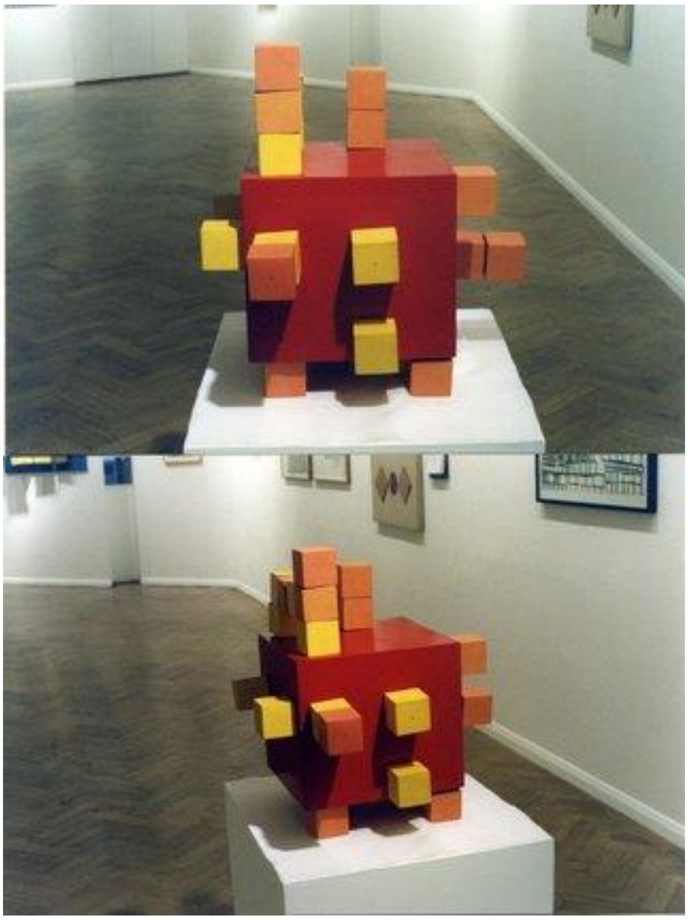


Figure 76: Stephen Willats. (1963) *Colour Variable No. 3.* Groundcourse, Ealing.

In the catalogue for his 1979 Whitechapel exhibition, *Concerning our Present Way of Living,* Willats described the work as follows:

‘This work was one of a series of six constructions which together formed a learning system. Each work in the system presented the participant with a set of variables held within a fixed framework that could be manually changed into a self-determined order. The set of variables increased from work to work, moving from a wall construction where only small changes of hinged planes were possible to the omni-directional possibilities of the large red cube, surrounded by sets of smaller cubes which could be plugged in on any of its six faces …..’[338]

---

[338] Willats, S. (1979) *Concerning Our Present Way of Living*. Whitechapel Art Gallery & Stedelijk Van Abbemuseum, Eindhoven. p. 14

The sculpture was the third of a series of six, moving from wall pieces through to cubes such as this one, each of which were designed to be manipulated by the viewer. Moreover, each viewer had to record the changes he or she made to the works of art:

'Changes were to be noted by the participant on an accompanying form, displayed on the wall alongside the work. The series was designed to involve the participant in making relationships between perception, decision-making and self-determined behaviour'[339]

The note-taking element of this 'learning system' has fascinating parallels with the Aircraft Control Environment which Ascott had experienced. As his recollections demonstrated, in the bunker readings from machines and screens would be cross-referenced with notes with more notes being made about new information as it appeared. The physical manipulation of objects, maps and displays was necessary to keep information up to date. This work of art relied on the same kind of cumulative qualities of information; in this case the manipulations made by previous viewers. In addition, the 'system' of the six sculptures became an analogue for the decisions and actions of these viewers. Furthermore, the systemic set-up of the sculptures, charts for note-taking and sequentially developing forms created an interactive environment in keeping with Groundcourse pedagogy.

The level of interactivity that the analogue concept gave Groundcourse is further demonstrated by the photographs in Figure 77 (Overleaf). Far from the typical studio environment in which students would work individually on the same task, Ascott's pedagogy demanded integration, self-awareness and the development of group dynamics. The machines below are surprising in their complexity - often an analogue

[339] *Ibid.* (1979) p. 14

machine was the prescribed outcome of a particular project or exercise. The serious concentration and the smart demeanour of the students as they studied their intricate mechanics imbued the studio with a laboratory atmosphere.

However, a concentrated look at the analogues themselves makes clear their purely creative function. Elaborate loops of paper, sculptural elements, rudimentary structures in wood and card. The seriousness is beguiling, and in this context, performative, particularly in light of the explicit conceptual underpinning for such exercises. With interaction comes performance; with performance comes environmental awareness. As each exercise unfolded into a form of interaction, the self-awareness that this created became the basis for a behaviourist experiment in visual art production.

Figure 77: Anon: Students of Roy Ascott. (c. 1963) *Groundcourse Students working on Analogues*

vii) Interactivity and Behaviourism

These interactive approaches described above could not fail to make students self-aware, as well as aware of each other and other groups and individuals with whom their practice was connected. As well as being objects for manipulation and contemplation, the analogue machines were often linked to an experience, project or performance. Ex-student John Bonehill described an exercise to me as follows:

‘We were divided into groups of 3. Project: Go out into town, & cause a ripple in the 'Aether', cause disruption by any means available, i.e. cause a traffic accident, or commit robbery, anything which will cause a reaction. Then write an essay describing what happened. Make a drawing, & diagram, then build a machine that expresses the essence of the incident. 1963…’[340]

Bonehill himself staged his ‘ripple in the aether’ by undertaking a fake bombing of the London Underground at Mansion House station, an action that got him suspended from the college for a couple of weeks. The unusual instruction to create a machine to express the essence of an experience presented students with complex questions about how to break down and share information. A machine is a system and it is defined by function. If its function is purely that of communication then it becomes a symbol, but a symbol with interconnecting elements. Ascott describes this interconnectivity:

‘And then they would have three kinds of elements to deal with first of all we would set them a project what we want you to do is to invent and design and build and play a game and to do it you’ll be in groups of six - five is a better number but it was 6 – the thing of it is you could only do what this thing called a calibrator allowed you do on this calibrator you would divide up room size, number of people, whatever against running, standing sitting, no eyes, no legs, no ears, no speech and that would be like behaviours, environments, materials, sand, rope, paper…’[341]

[340] Sloan. *Op. Cit.* (2011) Interview with John Bonehill.
[341] Sloan. *Op. Cit.* (2012) Interview with Roy Ascott.

Within these groups, students would be set tasks which related to their personality mind-mapping; more specifically, they would be given responsibility for something which they would find difficult:

> 'The student who thinks himself "useless" with, say, colour, machine tools, or objective drawing may find himself with sole responsibility for these things in his group. The shy girl must act out an easy sociability; the aggressive youth must become cooperative. One student may be limited to transporting himself about the school on a trolley; another may not use paper, numbers, or adhesive substances.'[342]

The student mentioned here transporting himself around the school on a trolley was in fact Brian Eno, although there is some confusion about this matter. In Shanken's account, he named Pete Townshend as the student described in Ascott's account, but in Bracewell's book Eno is quoted reminiscing about the exercise:

> '…I wasn't allowed to move. I was very energetic, and so I had to sit on a goods trolley until somebody moved me. Also, because I tended to like making plans but was hopeless about doing anything, I became the person who had to make things – actually build things. When something needed to be made, they would wheel my trolley into the workshop and I had to make it – and this went on for the whole first term.'[343]

Given that Eno is quoted directly on this matter, we can safely attribute this particular experience to him. There are certain misunderstandings in Eno's recollection of his experience in comparison to Ascott's intentions in that the pedagogy was not designed to limit the students, but rather to stimulate them to find new solutions and modes of behaviour, an almost alarmingly manipulative approach to addressing weaknesses.

The link between cybernetics and behaviourist tendencies in British art pedagogy is an interesting and little-discussed aspect of 1960s art education. There are a number of ways in which cybernetics provoked behaviourism. Firstly, the key aim of

[342] Ascott. *Op. Cit.* (1964) p. 40
[343] Shanken. *Op. Cit.* (2007) p. 205

understanding the function of the human mind in order to replicate it demanded the scrutiny of human responses and actions. Secondly, there is an interesting parallel between the psychological tension of scrutiny and the tense surveillance which characterised the Cold War. While the second point is speculative, it has clear relevance to a course which was built upon the visual language and physical interactions of cybernetic warfare. It was the writings of B. F. Skinner that introduced Ascott to behaviourism. Skinner was the leading author on Behaviourism in the 1950s and 1960s, a period in which the possibility of a science of behaviour was much discussed. In his 1953 book *Science and Human Behaviour,* Skinner wrote:

'Certain processes, which the human organism shares with other species, alter behaviour so that it achieves a safer and more useful interchange with a particular environment. When appropriate behaviour has been established, its consequences work through similar processes to keep it in force. If by chance this environment changes, old forms of behaviour disappear, while new consequences build new forms.'[344]

This idea was the basis for the book, which explored the potential for developing a science of behaviour, particularly with reference to the kind of behaviourist experiments which had been used on animals in a Pavlovian manner. Skinner gave an analysis of behaviourist technique, from the individual to the collective and within the perimeters of existing models of social control such as religion, government and economics. In line with cybernetics, the approach to human behaviour was treated as a biological problem, human life reduced to organism within a system. He commented:

'…machines have become more lifelike, and living organisms have been found to be more like machines. Contemporary machines are not only more complex, they are deliberately designed to operate in ways which resemble human behavior.'[345]

[344] Skinner, B. F. (1953) *Science and Human Behaviour.* Pearson Education Inc. p. 1
[345] *Ibid.* (1953) p. 49

From the interwar mechanised biology of D'Arcy Wentworth Thompson to post-war computers which could perform tasks previously only achievable within the human brain, behaviourism developed along the same theoretical path as cybernetics during the 1950s. Skinner published his first book on the subject, *The Behaviour of Organisms*, in 1938, in which he introduced the concept of respondent and operant behaviour. The focus on science in this later book can be read in the wider context of post-war interactive technologies. Given the paranoia of the Cold War environment, a science of predicting and controlling human behaviour was an attractive prospect. The dark potential of behaviourism was explored in popular culture too - a notable example being the 1959 novel *The Manchurian Candidate.* The difficulty of behaviourist science arises from the fact that somebody – a person or agency – must always manipulate the responses and resulting behaviours of the subject. There is an element of calculated and objective control.

There was an element of objective control in Groundcourse teaching experiments which saw staff scrutinise the actions and reactions of students in certain created circumstances. As noted, in *Re-Make/Re-Model: Becoming Roxy Music*, Michael Bracewell includes interview material with Brian Eno pertaining to his time as a student of Groundcourse at Ipswich. While it is not the intention of this study to focus on the number of future musicians who attended art school during the post-war years, it is worth mentioning Eno's reflections on Groundcourse. He recalls the level of psychological manipulation which underpinned the course, offering several anecdotes about experiments and classes. He described an incident in which there was a notice instructing students to assemble in the quadrangle at 9.30. They did so and suddenly all the doors were locked behind them. The staff then assembled with chairs on the flat roof and studied them. Eno recalls:

‘Then Tom Phillips read this text out, I think over a megaphone, and it was a quote from Lenin; it said something along the lines of “You are worse than chickens. A chicken will be trapped inside a chalk circle, but you have drawn your own chalk circle and trapped yourselves.” And that was the only thing they said.’[346]

Eno describes the range of behaviour this act inspired from the trapped students, from shouting and threatening to smash windows to group protests and banging. This has echoes of B. F. Skinner, who noted that:

‘If a cat is placed in a box from which it can escape only by unlatching a door, it will exhibit many different kinds of behavior, some of which may be effective in opening the door.’[347]

They could have sat quietly and waited for the three hours for which they were held captive, but the tension of captivity coupled with the overhead surveillance by their teachers provoked these more self-conscious and performative reactions. It is worth noting that this experiment predated Peter Kardia’s ‘locked room’ art pedagogy at St Martins by at least four years.[348] Kardia’s experiment was more extensive as it lasted a full term and students voluntarily turned up in the morning only to be locked in the white space of their studio for the morning. However, the notion of confinement ties Kardia’s experiment to the Quadrangle experiment at Ipswich: a test of how students would react to their liberty being restricted and their actions scrutinised.

What is most interesting about these exercises in confined creativity is that in both cases, teaching staff had no idea how students would react and it was thus as much a

[346] Bracewell. *Op. Cit.* (2007) p. 205
[347] Skinner. *Op. Cit.* (1953) p. 49
[348] See Westley, H. (2007) “ The Year of the Locked Room”. *Tate Papers.* Issue 9. Spring 2007. http://www.tate.org.uk/context-comment/articles/year-locked-room

learning experience for them as for the students. While the relative allowances of freedom and control are the defining elements of any pedagogy, it was not the intention of either experiment to simply limit or control what students learned. Rather, it was to provoke unease and to explore the tension of observation. While the pedagogical underpinning for exercises such as these was to engage students with their own reactions to limitations and possibilities within their environment, the exercise was created in the spirit of mutual experimentation. Both student and teacher had little idea of what the outcomes might be. There is an issue here of relative power and agency for those involved. The notion of control was an important one within Groundcourse. In 1966, Ascott contributed the following statement to *Control Magazine,* a journal which was founded by Groundcourse alumnus Stephen Willats:

To control ones
environment is to assert ones
existence, In controlling my identity
I define it. The Free Man has control of every
aspect of his world and creates his role within it
("remakes himself" in Nietzsche's terms). Although
through science we strive for this total freedom, it may
never be attained. Art, however, provides the means to win
this freedom and to act it out–symbolically. In Art the will to
control is expressed through processes of restricting experience
and of creating in familiar relationships within a universe of visual
discourse. In this way the Artist becomes the Free Man. Just as my
own artwork feeds back to affect my subsequent behaviour, so in
society generally the artist activity may function as some kind of
ritual control mechanism. Both individual artworks and cultural
clumps can act as behavioural triggers. But the cultural force not
only controls a Social Situation it constantly assigns to it fresh
goals. This is not a steady state control – it is one affecting a
changing, fluid field. This is one kind of value, amongst others, that
I want my public art to have. It requires the New, unfamiliar forms
And unpredictable relationships. These come only out of
creative behaviour – unleashed, non-routine constantly shaken
up. It involves taking risks, stretching the intuition. There
is a most splendid paradox in Art that often the wildest,
most far out, random unprogrammed activity can
in the end produce work which may exercise
the most profound and fruitful control
of the human situation
ROY ASCOTT

Figure 78: Roy Ascott. (1966). Statement from Control
Originally published in *Control 1.* No. 1, 1966.

In the editorial for the first issue, Willats wrote:

'*Control'*s main function will be to publish articles by the personalities which make up the new attitude in visual communication. Control will be organic in the sense that each issue will either be given over to a group of people which present a unified point, or will deal with a specific subject, and various designers etc. with different approaches will be asked to contribute to an issue, this will insure that Control becomes fluid, and also vital in so far as it acts as a common forum.'[349]

[349] Willats, S. (1965) "Editorial". *Control Magazine.* Issue One, 1965

Its contributors were Logie Barrow, Mark Boyle, Dean Bradley, Willats and Ascott. It is an interesting title for a journal of art, reflective of their desire to formally explore the cybernetic and behavioural tendencies they had developed within fine art pedagogy and practice. The discussion above echoes Ascott's approach to manufacturing 'organisms' out of the student body – fluid and reactive but only, vitally, within the given perimeters of control. Control in this context of arts and communication is about creating structures for human behaviour, about organisation and about the pursuit of the most productive systems possible. Ascott's statement in *Control Magazine* ends:

'There is a most splendid paradox in Art that often the wildest, most far out, random unprogrammed activity can in the end produce work which may exercise the most profound and fruitful control of the human situation'[350]

The convergence of chaos and order interested Ascott, who subscribed to the Cybernetic principle of requisite variety as previously noted. The cover of the journal had a plain circle in purple and Ascott's statement echoed this form in its concrete arrangement of text. Later journals in the sequence featured squares and later networked forms and images.

This conceptual underpinning – controlling and restricting experience to produce results – has clear relevance to the behaviourist aspects of Groundcourse. In his statement for Control I Ascott wrote: 'In art the will to control is expressed through processes of restricting experience and of creating in familiar relationships within a universe of visual discourse', and then:

'Just as my own artwork feeds back to affect my subsequent behaviour, so in society generally the artist activity may function as some kind of ritual control mechanism. Both individual artworks and cultural clumps can act as behavioural triggers.[351]

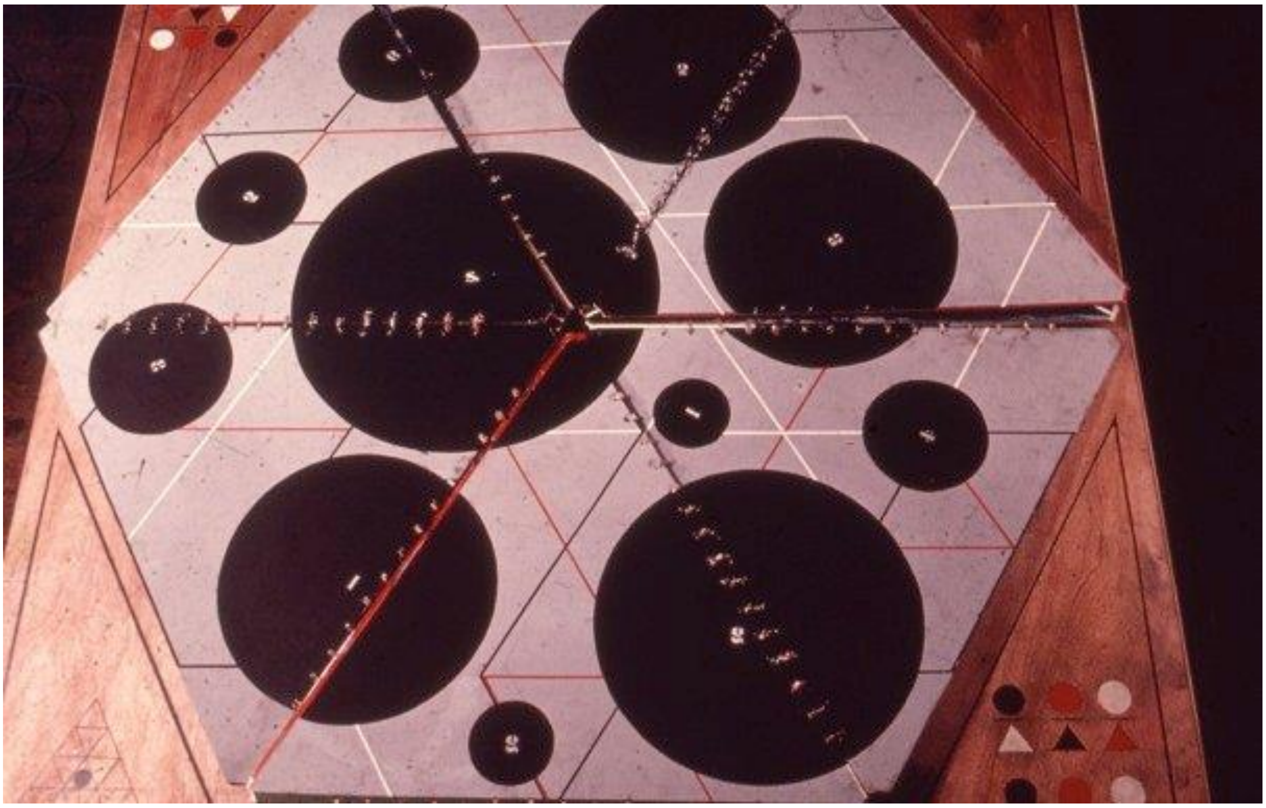
[350] Ascott, R. (1965) "Statement". *Control Magazine.* Issue One. 1965
[351] *Ibid.* (1965) p. 1

Ascott argued that the artist ‘controls’ the processes and reactions around the work of art, a creative ideology in line with the high modernism of the 1960s. However, when this is applied to visual arts pedagogy, the issue of control becomes more problematic. Of course, the relative power of student and teacher is central to the creation and critique of pedagogy and throughout history this relative power has been the source of debate and often the stimulus for revolution. While Ascott was striving to make the students ‘free men’ through giving them control over process, within the context of Groundcourse they were part of a defined environment of rules and limits. They were subject to controlled experiments; their modes of behaviour were scrutinised and adjusted, their preconceptions dismissed and replaced, their own agency limited by their place within a larger ‘organism’.

This mode of pedagogy cannot be limited by a description such as ‘class’ or ‘exercise’ – it was a mass of interconnected ideological concerns approached through experimental techniques as well as creative activities. It was an experiment in the control and mastery of the psychological process of art production; both students and staff were part of the experiment but since the staff had the greater control, it was the students who were the subject.

2.5) The Analogue Game:

Systems, Structure and Control



Groundcourse Board Game 1965

i) Games within Groundcourse Pedagogy

Games were an essential part of the Groundcourse pedagogy, a fact that is unsurprising when you take together the elements of behaviourism, analogue mechanisms, group dynamics and interactivity which characterised the course; each a key part of game design. The relationship of the analogue machine to the game is played out within the context of Groundcourse; the systemic or mechanistic elements of game design emphasised. Furthermore, in the symbolism and dramatic play of the games constructed by students, there is further evidence of the impact of World War II and the Cold War. Within the course pedagogy, games served as exercises in systemic thinking, in codified design, in environmental awareness and, interestingly, as prompts for behavioural analysis. The games design activities provoked a kind of self-conscious tension in participants; the knowledge of surveillance appeared to provoke a weighty, concentrated form of 'play'. In the creative outcomes of 'performing' the games under conditions of observation, there are rich and surprising parallels with the secret and pressurised environment of Aircraft Control.

Much of the visual analysis within this chapter is comparative, forming a link between what I will call the aesthetics of Cold War technologies and the art produced within Groundcourse. I have undertaken to do this for a simple reason – Ascott never made explicit links between Groundcourse and warfare, although by focusing on cybernetics, military environments and technologies were absolutely vital. By forming a comparison between wartime technologies (and environments) with the radical visual arts exercises within this chapter, I hope to offer a much more thorough criticism of both the formal language and the conceptual drive of Groundcourse. The themes confronted within this chapter also have further resonance in other areas of the visual arts of the post-war period. As well as the philosophical shift marked by the broad impact of systems technologies on culture, the *look* of technologies of the period was also a vital influence upon visual arts and design practices: in colour, shape, style and material, there is a language of form which translates to several strands of contemporary art of the period, from constructivism to minimalism. Within the pages of this thesis there is no place to discuss this more fully, but I hope that the work undertaken here will open up a broader discussion of the vital interplay between technological development and the aesthetics of modern art in the post-war period.

ii) From Analogue Machines to Games

The analogue machines discussed earlier in this case study have much relevance to the associated exercise of game design. The link from the analogue machine to game is the level of human interaction and activity each exercise provoked. Figure 79 (below) shows students manipulating analogues as part of their behavioural project. These images are fascinating as in each photograph the students are clearly making notes from the analogues; manipulating them and recording their 'findings'. The analogue machines of Groundcourse were designed to be operated, unlike the kinetic sculpture of earlier practice and pedagogy, from Bauhaus to Basic Design. This new interaction extends the work of art into an active thing, therefore involving process and performance. The object, its immediate environment and the people around it therefore become part of a game of sorts.

In Figure 79 (below) the performative manipulation of these analogues has a definite echo of code-breakers working with cipher machines, particularly in the right hand image which so clearly resembles real cipher machines such as the one in Figure 80:

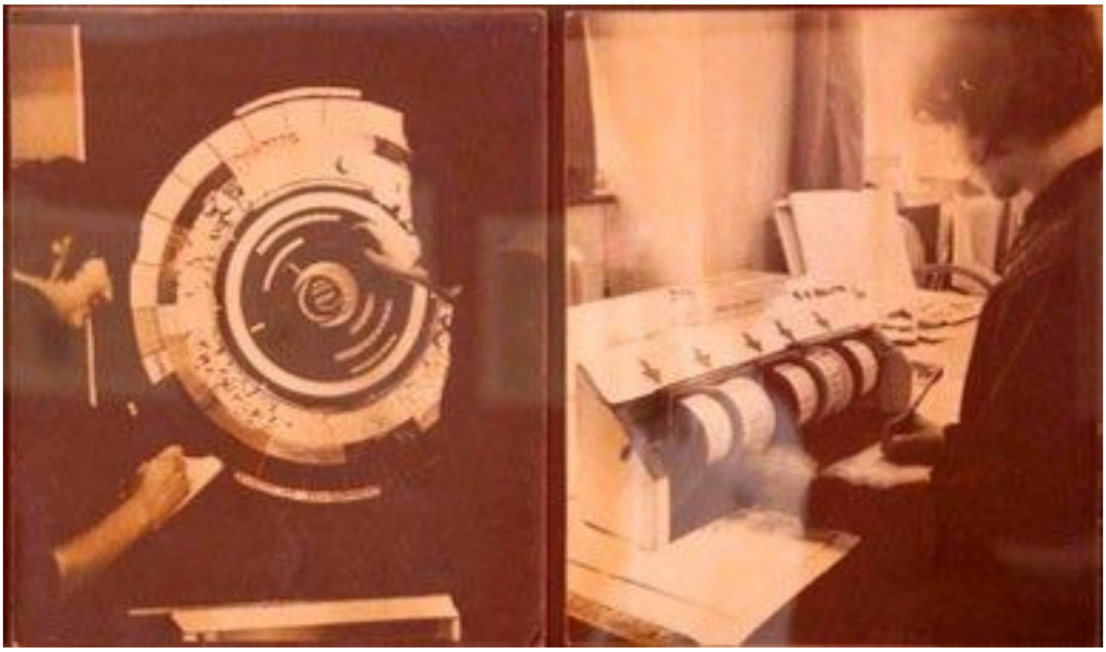


Figure 79: Anon: Student of Roy Ascott. (1963) *Groundcourse Behavioural Project.* Ealing.

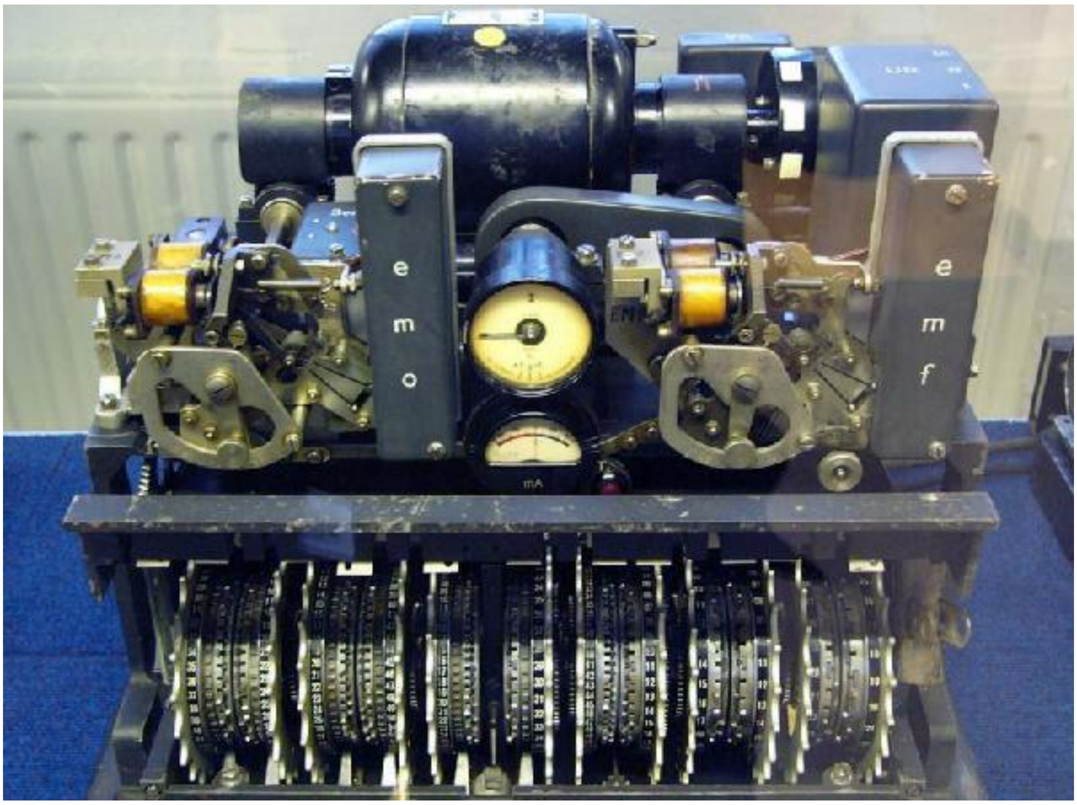


Figure 80: Anon. *Lorenz SZ-42 cipher machine*. German. World War II.

This is an extraordinary absorption of the code-making and breaking mechanisms of the war. Here once again, pedagogy becomes performance as the students manipulate machines that quietly recreate the tension of warfare. This quiet absorption of the language of wartime technologies is curious, given that Ascott and his teaching staff never made explicit reference to either World War II or the Cold War. Since cipher machines had been in use from the 1920s, they would have been familiar to all as a key element of the wartime struggle to gain information from the enemy.

In the 1960s however, the extent of the contribution made by code-breakers in and since World War II would have been unknown to staff and students. For example, the Colossus computer, used to decrypt messages from the German Lorenz cypher pictured above, remained a close-guarded secret until the 1970s. Despite this, the role of the cryptographer in decoding information and increasing national security was a familiar one. The echo of the cipher machine within these analogues is an explicit form of visual evidence, clearly linking the analogue art concept to these technologies of espionage.

The analogues were art objects. The pedagogy, however, demanded more of the students than their mere creation; they had to be objects for manipulation, for information and to some extent for performance. They were to be used within the environment of the studio, thus tying into the actions and reactions of the staff and students too. The sheer concentration of the students in Figure 78 reflects that they were engaged in a process; a performance of the meeting of man and mechanism, the core of cybernetics. It is important to remember that these mechanisms were primarily art objects - but in principle they were all ‘machines’ in the original sense of a contrivance of parts together performing a task. Furthermore, within the many-layered systems of Groundcourse, these analogue machines were part of the larger machine that was the course itself, with its staff and students the active components.

iii) The Cybernetics of Game Design

In order to move from the analogue to a game, the only adjustment that must be made is the introduction of an element of competition, or at the very least, the possibility of a beginning and end. A consciously designed game has rules and outcomes not just actions. Interestingly though, the theme of code or cipher discussed above also came across when Ascott described game design. Students were required to design games within the first year curriculum. Ascott wrote:

'Students set about analysing and inventing games, logical propositions, idea sequences, and matrices. Visual polemic is induced, and codes are designed and broken.'[352]

The language Ascott uses here is quite extraordinary – sequences and matrices, propositions, polemic and codes, the language of philosophy or mathematics. Figure 81 (overleaf) shows two photographs of student drawings in which they explore codes, games and sequences:

[352] Ascott. *Op. Cit.* (1964) p. 40

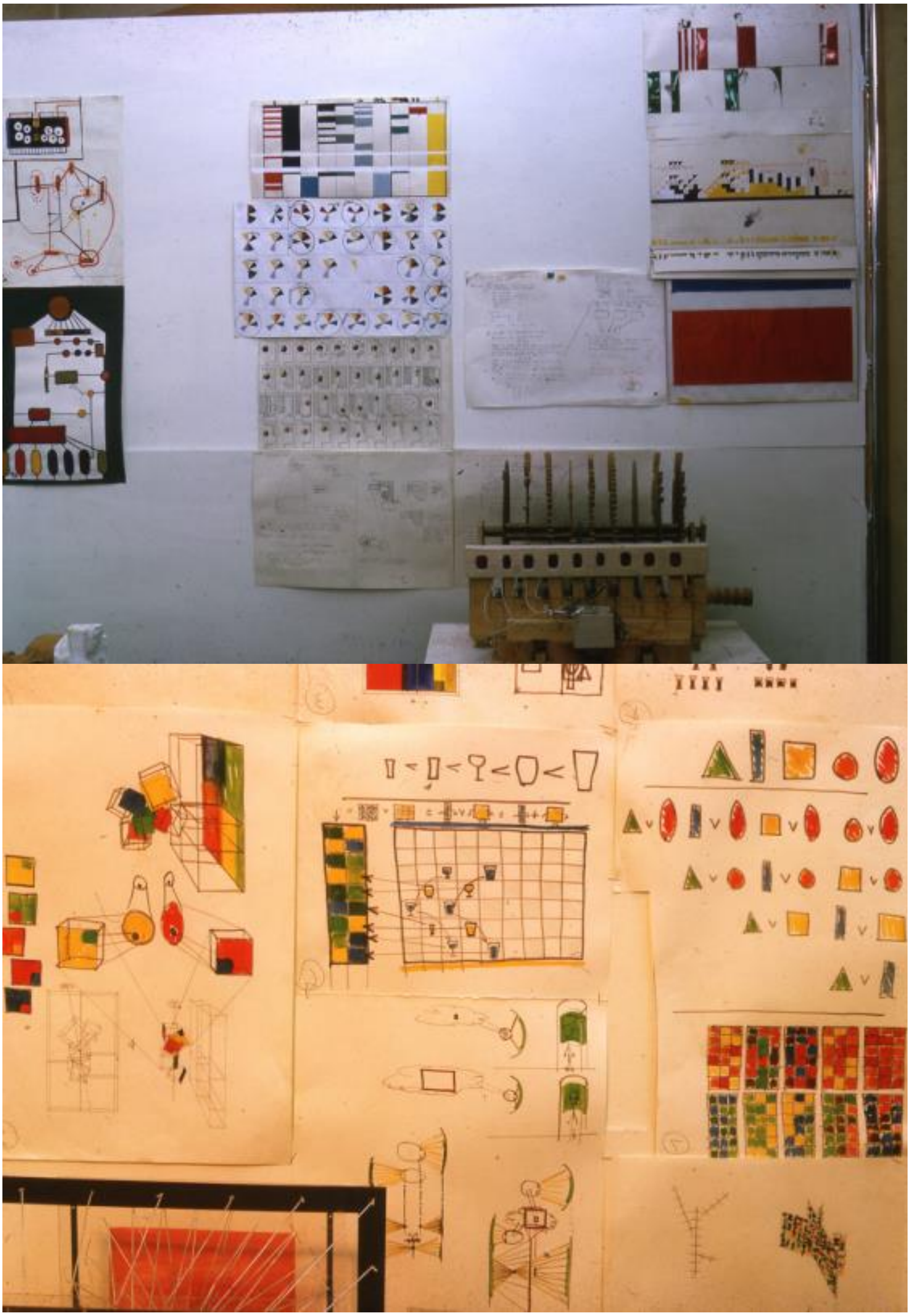


Figure 81: Anon (Students of Roy Ascott). (c. 1964) *Student Drawings showing Games, Analogues and Systems.*

The top image shows complex circuits and repeated patterns, as well as an analogue machine with a crank handle and wiring. The analytical quality of these diagrammatic drawings is striking; worked in black, white and block colour, they resemble the working drawings of engineers. These sequential drawings reflect the complexity of game design; it is logical rather than intuitive, often mathematical, always ordered. The students would have reflected on the key ingredients of a game, the progress through a series of tasks, challenges, questions or movements with the victor completing this series of tasks first. A game needs obstacles or limitations, an element of chance but the certainty of an outcome eventually.

As Ascott suggests, the matrix is a key element of the game; an organisational structure or grid in this context. The grid designs on some of the drawings above have a nodal quality, networks of components joined by wires. There are two layers to this – firstly, the students had been familiarised with the idea of connectivity as a concept within the course: participation, interaction, environment, material, action. They were familiar with their own role as part of the 'organism' of the course. Secondly, the visual qualities of these nodal grids were inescapably technological.

The lower image has working drawings for an analogue object at the bottom, and an analogue in frame and string is visible at the bottom left. To some extent games are essentially analogues in themselves; usually a moveable object marks the progression of players through a series of questions, actions or tasks. The board or set is analogous to the progress of the game. In the opening of this chapter I described Ascott's experience of Aircraft Control, an extended environment which involved coloured plastic pieces moving over a map, within a context of analogous display. The cybernetic environment of the Cold War involved the same visual language as the board game, from the moving pieces to the coded language of symbol, colour and shape.

It is no surprise that this wall of drawings demonstrates a common codified quality, with shape and form explored within systemic contexts. The drawing in the centre is evidently a design for a game based around different shapes and sizes of drinking glasses on a chequerboard. Other images show different grid colour formations, series of geometric shapes in primary colours, sequences of symbols evolving in shape and colour and complex connected grids like electrical circuits. The process of invention with a game involves an analogue mode of creative practice; developing a set of possibilities and a way to visually represent them. Making the rules and setting the boundaries; a practice of design that in many ways is ingrained with the behaviourist approach to provoking and analysing certain modes of human behaviour. Certainly, the games themselves have a strange energy about them; many of the photographs show contortions or frozen poses, physical interaction with a performative element to it. There is a kind of tension about this conscious performance of ‘the game’ as a model for art practice. One interesting photograph (Figure 82, below) shows the stark instructions to one student’s game, black letters on red:

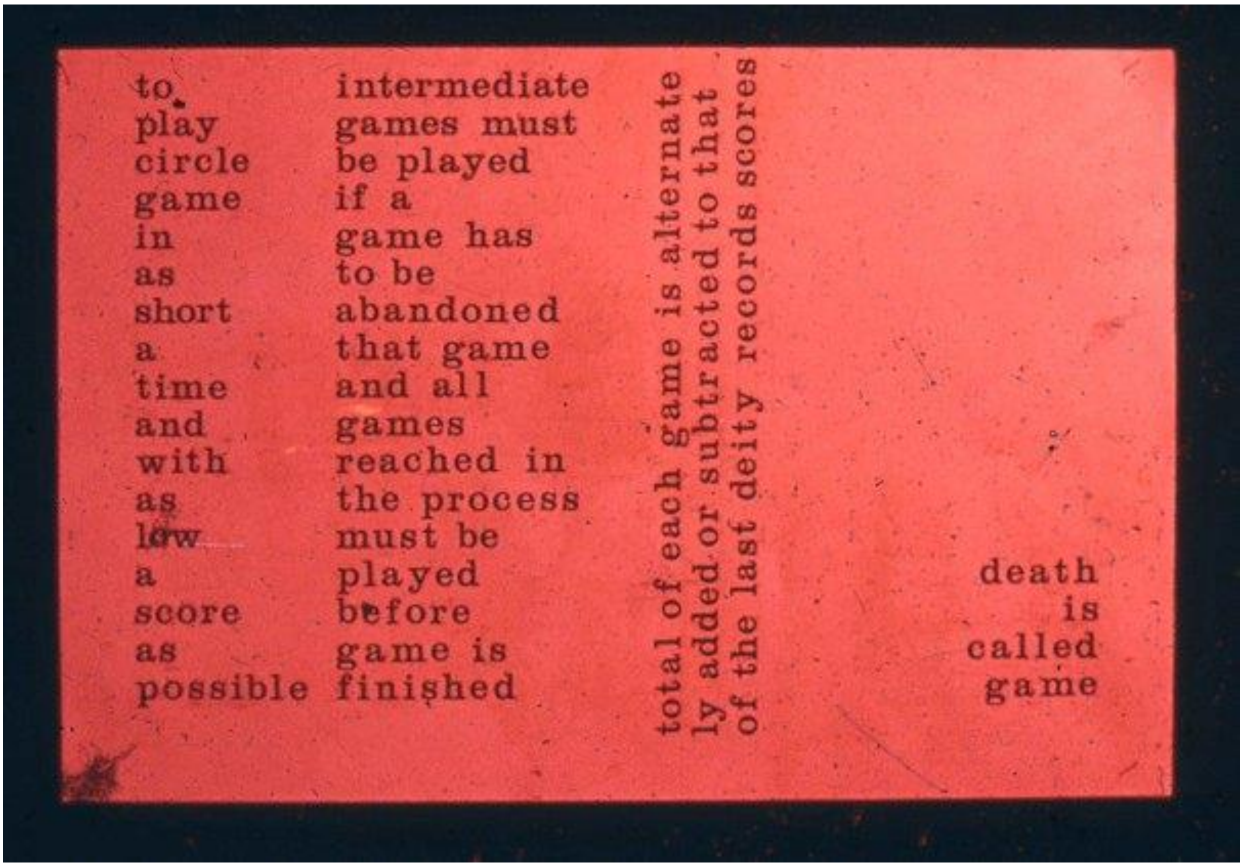


Figure 82: Anon: Student of Roy Ascott. (1965) *Instructions for a Student Game.* Ipswich.

The instructions have a concrete arrangement of verticals and horizontals, forcing the reader to scan down the rows of text, to turn their head, to finally arrive at the plain proclamation ‘death is called game’ in black on red like a warning sign. This game runs against the convention of scoring highly; the winner must score as little as possible as quickly as possible. The rules state that ‘deity records scores’, a suggestion that the game is analogous to living and dying, with judgement in the hands of the Gods. The statement ‘death is called game’ summons cheerless thoughts of the inevitable outcome of a life’s journey.

iv) Visual Parallels: Aircraft Control and the Groundcourse Game

In both Aircraft Control and the Groundcourse games, bright, primary colours and black and white were used to signify function and meaning. The grid, the map and the route formed the backdrop to the manipulation of these signs and symbols, just as they do in the board game. Furthermore, in each game multiple players manipulated the analogues and created the meaning just as in a game. The images overleaf (Figure 83) shows the distinctive environment of the operations room at RAF Uxbridge, from which the Battle of Britain was coordinated. The table-top map and its pieces were manipulated by a large team, each with a long wooden sweeper and each plugged into a set of headphones:

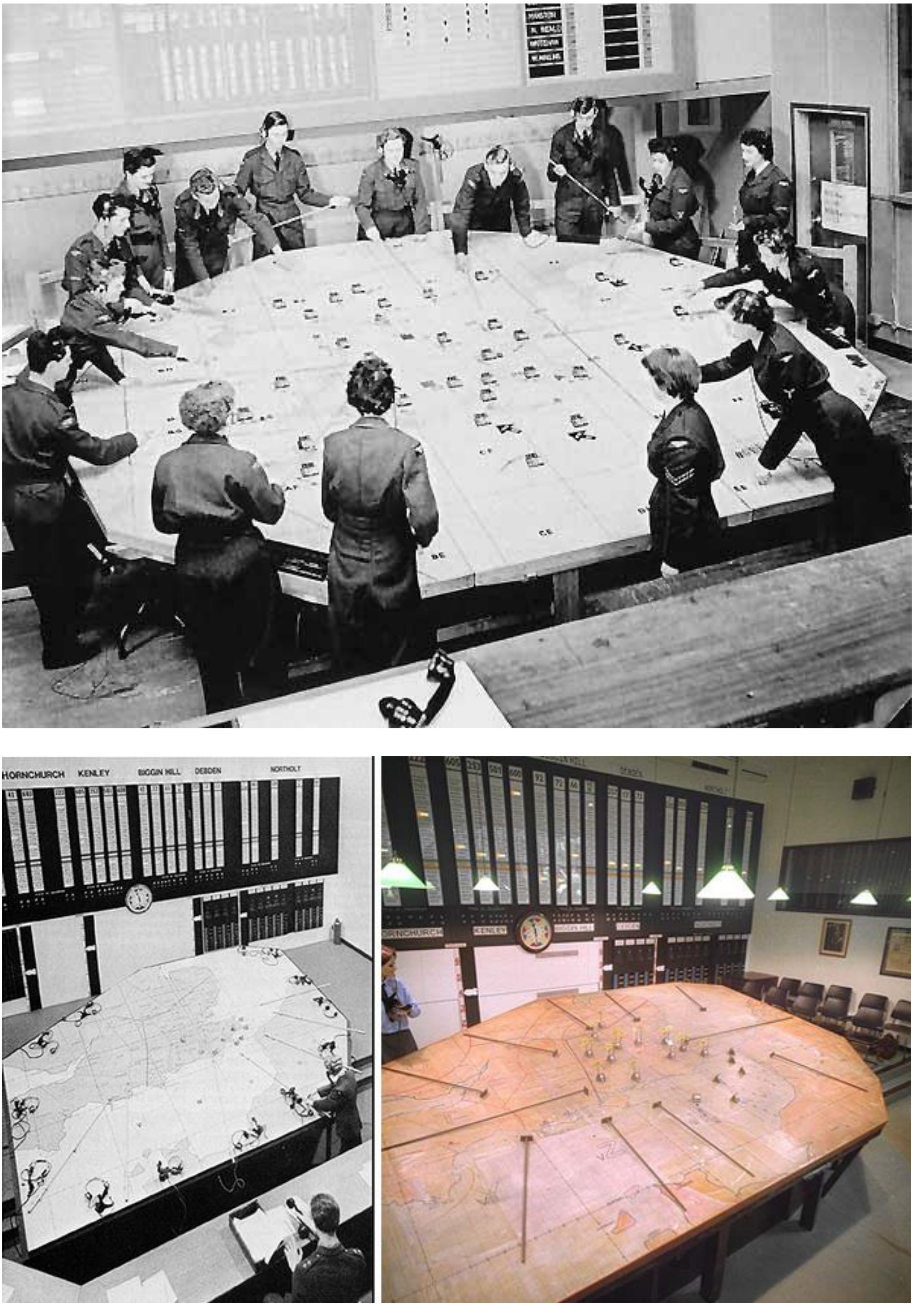


Figure 83: Anon. *Ops Room, Battle of Britain, RAF Uxbridge.*

The image of the empty table reduces the Ops Room to a set with its props: and in so doing make it easy to deduce the similarities to board games. The wooden sweepers and pieces wait for the players to advance and the map on the table surface could so easily be the matrix of play. The boards and set-ups for the Groundcourse games therefore have clear relevance to the cybernetic environment too. The hexagonal board below (Figure 84) has a distinctly technological appearance in its geometric forms:

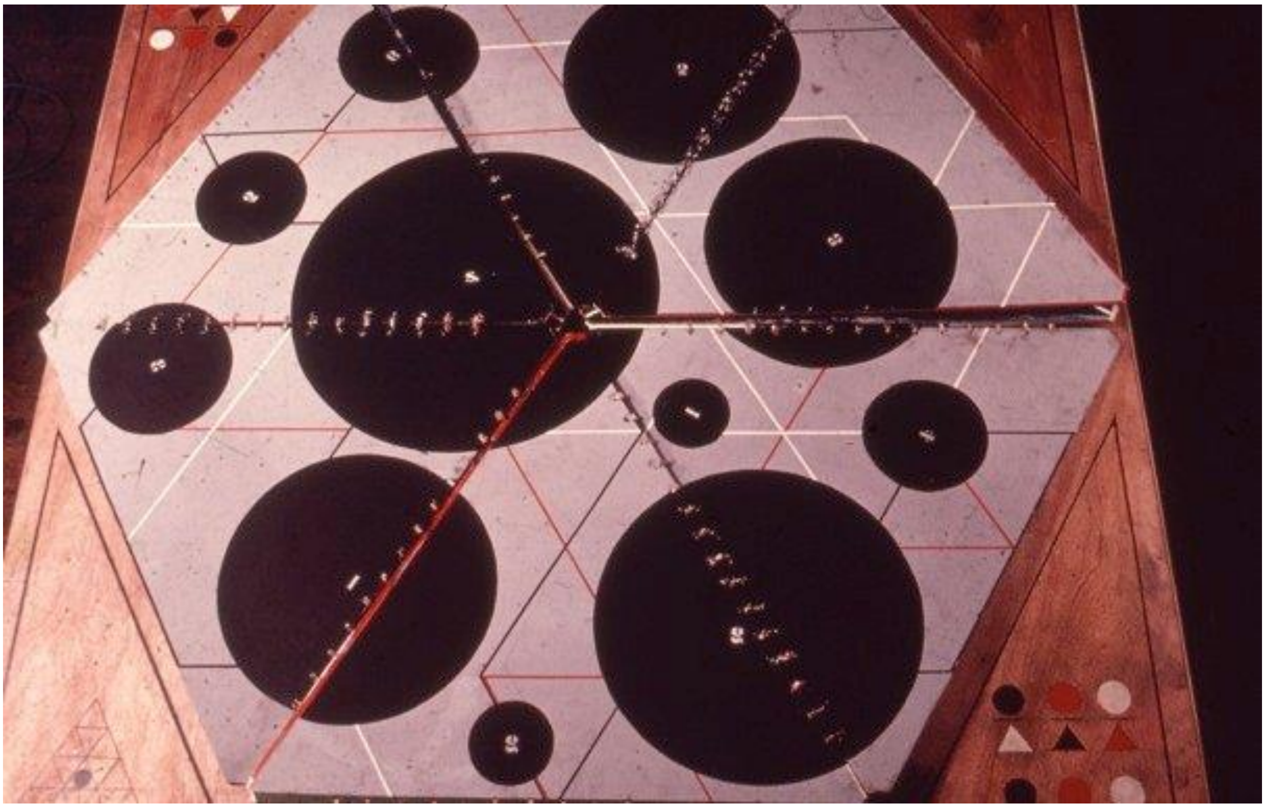


Figure 84: Anon: Student of Roy Ascott. (1965) *Groundcourse Board Game.*

In interview Ascott recalled that within the environment of ground control there had been pentagonal screens. He also mused that while group work had been set to groups of six, he wished it had been five, since it was a better number.[353] Most Groundcourse group activities had been performed in groups of six and the hexagonal form of this

[353] Sloan. *Op. Cit.* (2012)

board perhaps echoes this. Underneath the black circles are a series of geometric lines in red and black, forming a grid of parallelograms and triangles. The wooden board beneath is inlaid with symbols; circles and triangles in black and red. It is worth noting that black, white and red were colours which occurred frequently in the Ground Control environment. They are also the most reductive palette for any game: black and white the matrix of possibility and blood the human element, the element of life. Figure 85 (below) is the attack warning telephone from RAF Neatishead, a now closed Royal Observer Corps Station preserved as a museum:

Figure 85: Anon. *Attack Warning telephone.* RAF Neatishead.

The aesthetic qualities of this attack warning phone station are worth exploring. The colour scheme of neutral grey with red, black and white has a strong visual link to the scheme used for the analogue game in Figure 84. Likewise, the geometric lines used above the switch between 'alarm' and 'call' at the base recall the grid drawn onto the board game. The student work created during Groundcourse had a distinctive and recognisable palette. A palette of primary colours, black, white and gun metal grey. It was the coded colour scheme of war and its technologies.

The use of bright primary colours in intelligence environments was applied for very practical reasons, best illustrated by the so-called 'ops clock' which each control room contained during World War II (one is visible in Figure 83, the Uxbridge Ops Room). The ops clock had intervals of minutes divided up by bright, primary coloured flags (see Figures 86, below and 87, overleaf).

Figure 86: *RAF Control Room Ops Clock*.

Figure 87: *Hostile Pilot Marker, Ops Room*

In the frantic environment of the Ops Room, when each operator received information about a raider crossing into British waters they would colour code their marker within the five minute interval on the clock. This information was crucial as it had to be accurate to within these time limits in order for fighters in the air to make their interception. Primary colours were used as they are by nature the most starkly different from each other as they are unblended. Black and white, used for the background, are neutral. Black and white grids, structures and diagrams form a matrix for information and the coloured elements are the variables. Figure 88, overleaf, shows a Groundcourse student playing the same game that was discussed above (Figure 84). Here, the board has been unfolded to reveal coloured hexagons made up of triangular 'flag' shapes that again have a strong visual relationship with the Ops Room.

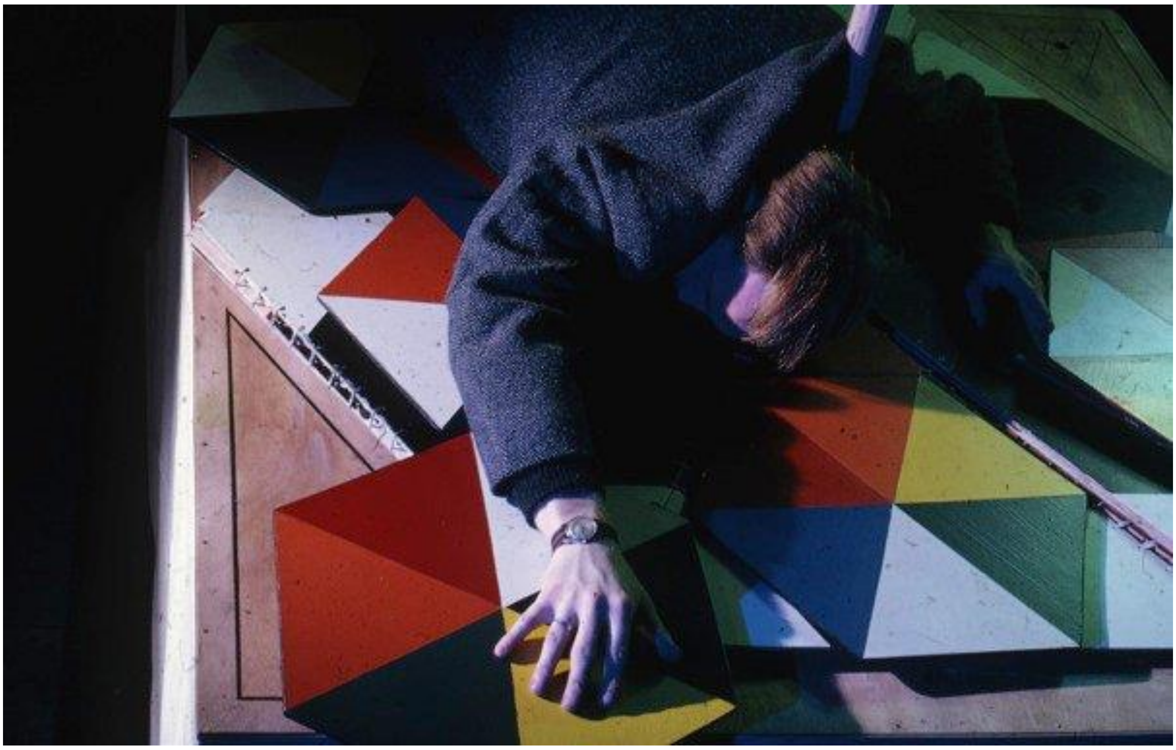


Figure 88: Anon. (1965) *Student playing Game.* Groundcourse, Ipswich

Another photograph of this extraordinary game was described by Shanken as a precursor to the board game 'twister'.[354] However, this process of game-playing was not light-hearted. Each student's results and responses were noted down as part of a mind-mapping exercise which then helped them to understand their own behaviour and to try and respond differently. In addition, the photographic records of these games

[354] *Op. Cit.* (2003) pp. 38-39

demonstrate intense concentration on the part of the players, as well as self-consciousness. The game, therefore, served as a prompt for behaviourist analysis.

Figure 89: Anon: Students of Roy Ascott. (1965) *Student Playing Game*. Ipswich.

In Figure 89 (above) the player leans over the board, manipulating it with a long stick much as the RAF Fighter Control staff leaned over their tables and pushed their markers into place. There is a resonant link here, a vital one. In terms of the format of the board game, this link to early cybernetics has extraordinary richness.

To some extent Shanken's reference to 'Twister' can be understood in that the physicality of the game and the contortions of the player's body are quite evident.[355] It is also notable that the lighting in the room – for this game and for others – was dramatic, at times flooded, at others subdued and shadowy, but never natural. The games are played out as if on a stage; the players could really be in an underground bunker rather than in a college art studio. This dark and oppressive atmosphere is intensified by the presence of cloaked and masked figures within the game, shown in Figure 90 (below):

[355] Shanken. *Op. Cit.* (2003) pp. 38-39

Figure 90: Anon: Student of Roy Ascott. (1965) *Groundcourse Game*. Ipswich.

The masked figures indicate student awareness of, and engagement with the tension of surveillance, something with which they had been tested and confronted within the perimeters of the course. Being watched and analysed was a behaviourist notion, but it also tied into the more serious surveillance that took place in the Op Room bunkers which these student games recall to an extent. Within the context of the Op Room, there were layers of scrutiny including the intelligence gathering which was the object of staff and then scrutiny of staff too, in an environment in which espionage was a natural threat. There was the layer of scrutiny between staff too, as the actions and tasks fulfilled by each member of that complex team were intertwined. For the student games, scrutiny came from their fellow players, their observing class mates and the teaching staff. In Figure 91 (below), the student player picks up a circular disk with deliberation, his head turned towards the student at his shoulder whose face is obscured with a bag with eyeholes:

Figure 91: Anon (Student of Roy Ascott). **(**1965) *Groundcourse Game*. Ipswich.

His fingers are pressed against the table, giving a palpable air of physical tension, perhaps only from the physical contortions required by the game. However, the eerie lighting and close scrutiny from the masked figure gave the scene an undeniable atmosphere of seriousness, far from any kind of game 'play'.

Figure 92: Anon (Student of Roy Ascott). (1965) *Groundcourse Game*. Ipswich.

In Figures 93 to 96 (p. 285) I have placed an RAF Ops Room against a photograph from a Groundcourse game, featuring a young and serious Brian Eno sporting a top hat. The students have created a bunker of sorts. The visible walls are constructed from foil and a geometric grid of paper pyramids and the ceiling is covered with swags of white fabric, creating a total environment for their game/performance. The white and silver colour scheme has a (somewhat homemade) sci-fi edge to it, but the most intriguing element is certainly the sense of enclosure the students have created, with its echoes of secrecy and its visual relationship to the ops room.

In this game a red ball is thrown over a white board with hills and valleys, the students once again employing a reductive colour scheme of white, silver/grey, red and the black of clothing. Figures 95 and 96 (p. 286) create another interesting comparison. In the Ops Room, a female member of staff holds aloft a long stick as she and colleagues study the table-top map before them and male colleagues look on from above. In the Groundcourse game, Brian Eno has a long black stick, holding it aloft as he studies the topography of the white table-top landscape before him:

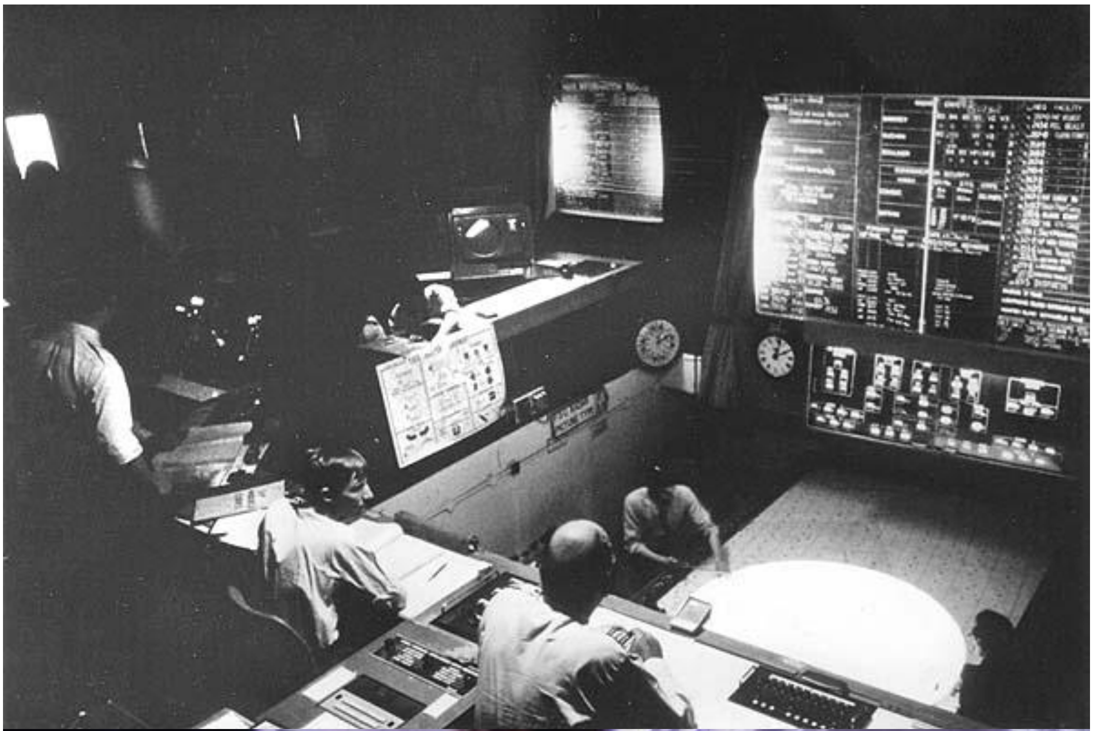


Figure 93 (top): *RAF Operations Room*

Figure 94 (bottom): Students of Roy Ascott. *Groundcourse Behavioural Project.*

Figure 95: Ops Room, Bentley Priory (RAF Fighter Command Head Quarters)

Figure 96: Students of Roy Ascott. *Groundcourse Behavioural Project.*

It is clear that there is a visual relationship between the format of the Groundcourse game and the cybernetic environment of Aircraft Control. Perhaps the most interesting element of the parallel between the two is not simply aesthetic but human; the strongly behaviourist inheritance from which Ascott developed his particular brand of visual arts pedagogy. Because of the weight given to knowing oneself and critically assessing action and reaction within a given environment, the act of game design and play within the course was far from light-hearted.

The photographs overleaf construct another interesting visual parallel – this time between the construction of bunkers, radars and the grid structure in which a 1965 Groundcourse game was played out. The students hang and climb in the frame, a simple three-dimensional grid. It has echoes of the utilitarian structures of the bunkers themselves, which were functionally constructed and often metal supports and pipes were left exposed. Radars - which fed the information to Aircraft Control – were similarly based on grid structures, mainly built into the curve of a satellite dish but sometimes in square format like the radar at RAF Sopley (Figure 98, overleaf). The parallel I wish to draw here is not about function – it is about the aesthetics of the Cold War environment and how this translated into the look of Groundcourse outcomes. The eerily lit structure (Figure 96, overleaf) within which the students play out their game retains a sense of utilitarian architecture, of functionality being used for play rather than design, somehow:

Figure 97: Students of Roy Ascott. (1965) *Groundcourse Behavioural Project.* Ipswich

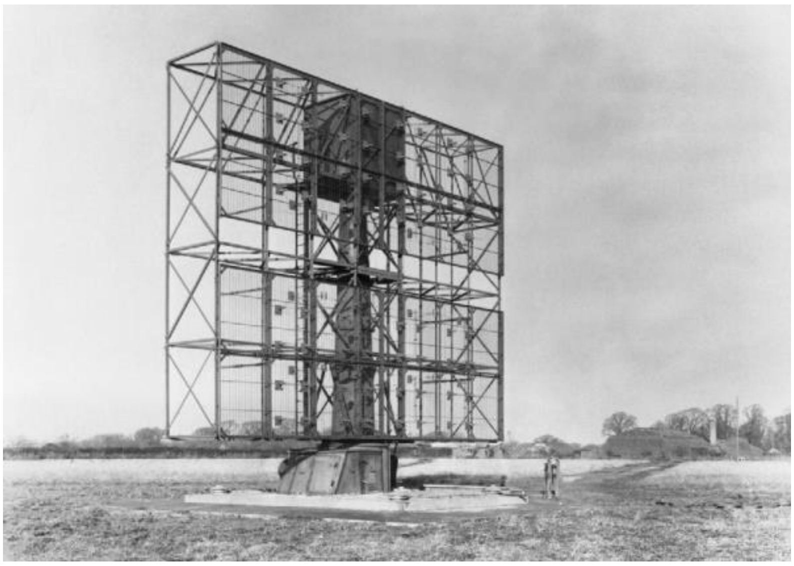


Figure 98: Anon. *GCI (Ground Control of Interception) radar installation at RAF Sopley*. Hampshire, 1945.

The performance of the game in figure 97 also highlights an interesting aspect of the new cybernetic age - the architectural forms of modern technologies and the materials used to create them were an entirely new physical experience for people occupying these spaces. The Ops Room was a hub. It received data which streamed in from the pulses of the radar and it was passed on via telephone, physically recreated on a map, cross-referenced and shared. Information appeared on screens. This in itself was the remarkable beginning of a phenomenon so familiar to us today as to be almost imperceptible: the change in spatial dynamics wrought by real time information streamed onto screens and through the analogue displays.

The information inside these enclosed bunkers represented an extended geography; an ocean to be guarded from attack, a wide, open and dark space as extensive as the bunker was limited. The collision of the enclosed architectural environment with the extended space of surveillance came about through the displays, technological and analogue, which invoked this larger geography. Thus the extension of space which these technologies created was a new and dynamic experience for those who experienced them; including Roy Ascott. In Figure 97, the grid becomes a three-dimensional game. The players negotiate it, climb from it, hang from it. The grid is the matrix of the game and the players in this context move physically through the matrix itself. This physical encounter extends the game play into an environmental experience, exploring the dynamics of this grid form which not only reflected the underlying logic of game design, but also the physical experience of a very modern environment.

3) HORNSEY:
THE PEDAGOGY OF PROTEST

AMHCA. *Don't Let the Bastards Grind You Down*. Linocut.

3.1) Introduction

This case study stands a little apart from the two which precede it, in that it focuses not on a defined pedagogical movement but rather on an art school protest – the Hornsey sit-in of May 1968. The protest highlighted the problems with the structure of art teaching in the UK after the introduction of the new DipAD. It is the assertion of this study that the protest can be treated as a pedagogical model in its own right, both drawing upon and rejecting the behaviourist and participatory trends which evolved over the previous decade in British schools of art. Moreover, in order to fully contextualise the Hornsey protest the historic notion of radical students protesting against an oppressive and traditionalist system must be abandoned and a more rigorous context, drawing in the radical period in art education which preceded the sit-in, must be established. Finally and vitally, I posit that the act of reclaiming and disrupting pedagogy was a method of overcoming the intrinsic issues of power and control which the behaviourist approaches of the decade had engendered.

The background to the protest, with particular reference to the policies which shaped art education in the period, was addressed by Lisa Tickner in 2008, with her short book

Hornsey 1968: The Art School Revolution.[356] However, I approach the protest from a different perspective. While the unsettled and restrictive environment caused by the policy changes for the new DipAD did create the conditions for protest, this was not the full story. The policy changes which led to the creation the new DipAD simply reflected the pedagogical practices of leading educators of the day, a number of whom have appeared in the pages of this thesis. In fact, the politicised actions of the students and staff involved created the surface layer of what was a complex response to the educational policy and practice of the era.

In Tickner's concise account of the events at Hornsey, her focus was recording the circumstances which contributed to the affair, as well as recounting the sequence of events. She writes:

'Forty years on, the occupation emerges not only as a 'social drama' revealing latent conflict over the rights of students, the politics of design, the needs of the 'microphysics of power', of power in its 'capillary forms', surging and ebbing through the charged relations of 1968.'[357]

Tickner offered a thorough account of events around the locus of the policy changes behind the DipAD and she synthesised for the first time the many factors which contributed to the conditions for the protest. However, her short book did not analyse the teaching culture at Hornsey. The issues of precisely how art and design students were being taught at Hornsey, the nature of the exercises, the formal and conceptual qualities of student work still lack critical attention. Also, the artwork produced during the sit-in, which ranged from installation and performance to campaign posters and theatre, is deserving of more thorough contextual analysis.

---

[356] Tickner, L. (2008) *Hornsey 1968: The Art School Revolution.* Frances Lincoln. London
[357] *Ibid.* (2008) p. 8

The protest itself was much more than a simple act of resistance to educational policy reforms. It operated on so many creative levels that it can equally be presented as a work of art in its own right. The unique collaboration of some staff members with students during the sit-in was vital both to the direction and form the protest took. With staff and students working together, the sit-in became a form of pedagogy too. What this case study will do is analyse the protest as pedagogy, reading it against the radical developments in art school teaching which predated it. Many of the themes which have occurred in the preceding two studies – systems, cybernetics, technology, behaviourism, control – come into play in the Hornsey protest. Given that the development of the DipAD was heavily influenced by the pedagogues who have been the subject of this study – principally, Hamilton, Pasmore and Ascott – there are interesting formal links between their ideologies and the eventual backlash which the Hornsey sit-in represented.

The political backdrop to the events at Hornsey is equally important - as the explosive events of May 1968 unfolded across the world, the fever of revolution infiltrated British schools of art too. It was in the midst of a worldwide fever of liberal rebellion that the students of Hornsey College of Art staged a revolution of their own. As noted, the events at Hornsey did reflect the growing dissatisfaction which both students and staff felt after the introduction of the DipAD, but there are other interesting layers to what occurred there. It was not solely a protest – it involved the production of works of art, happenings and events and the protest itself incorporated elements of performance. During the protest, students and a few members of staff produced extensive written statements, including their model for a new pedagogical structure to replace what they saw as a flawed DipAD system. This vital critical interaction between students and teaching staff within the social networks of the college will here be interpreted in the broader context of the pedagogical development which predated it. It involved regulated creative activity, discursive investigation, sustained and connected discourse, an unusual occurrence given that during the preceding decade, students had been very much the subject of experimentation, rather than active agents in their own education.

The final and fascinating layer to the protest was the production of a 'network approach' to curriculum structure by the students and staff involved in the sit-in. Through extended discussion of the art and design curriculum, the group came up with a model for the DipAD designed to allow freer movement between one discipline and another. While the structure itself was relatively simple, it has complex and resonant meaning. Firstly, the use of 'network' as terminology for a curriculum was extraordinary in itself. The term 'network' had been through a series of evolutions of meaning and by the late 1960s it was tied to new developments in communication technologies; specifically graph theory and the advent of digital computing. This technological metaphor was extremely contemporary both in itself and in its application at Hornsey – the group used the network system as a metaphor for more liberal values within the art school; greater agency for students and for staff.

The network structure was therefore used as a metaphor for pedagogical freedom. It is clear that there were issues of relative control recurring in 1960s art pedagogy, from the stricture of formal abstract language as defined by Basic Design curricula to the behaviourist analysis built into Groundcourse and the Locked Room at Central St Martins. In this context, the Hornsey network structure poses some interesting questions to do with the politicised construction of pedagogy and its concealed messages; the so-called ‘hidden curriculum’.[358] While the radical, experimental and often revolutionary pedagogical experiments which took place in art schools across the country in the 1960s marked a benchmark for the subject, the models of delivery focused on the student body and not the individual.

In their 1979 book *The Politics of Art Education*, Dave Rushton and Paul Wood reviewed the Hornsey sit-in and took an aggressively critical position concerning what they saw as an unresolved and flawed political stance on the part of those involved. This was incorporated into their broader agenda of situating the reform of design education against the demands of corporate design.[359] They dismissed the political positions expressed during the protest, focusing instead on the debate around educational reform for their broadly Marxist reading of design education in a wider context of the manufacture drive of the late 1960s. They wrote that the Hornsey documents contained only:

‘…rambling speculations on education theory, leading to pie-in-the-sky recommendations, based on loose assumptions about the nature of societies, institutions and individuals’[360]

They also described this as ‘typically introverted and mystificatory bourgeois theorizing’.[361] Both descriptions are notably condemnatory in nature, as if those

[358] The hidden curriculum was addressed at length in the introduction to this thesis. In the context of this chapter, key contributions from Paulo Freire and Henry A. Giroux (1983) will be used to analyse the dynamics of power in the DipAD curriculum structure.
[359] Rushton, D & Wood, P. (1979) *The Politics of Art Education.* Studio Trust. London.
[360] *Ibid.* (1979) p. 26
[361] *Ibid.* (1979) p. 4

involved really should have been more thorough in their production of political ideology. The authors wanted to distance themselves from the somewhat soft and amorphous focus on creativity which was at the heart of writing on arts pedagogy in the late 1960s and 1970s.[362] However, the authors rather unfairly judge the output of the sit-in in terms of politics when it should be judged within its proper context of art education. By extension they were not interested in the creative aspects of the Hornsey Affair and thus they did not treat the protest as an exercise in creative action. For the authors creativity was an over-valued and uninteresting subject within the wider discourse on arts pedagogy.

Lisa Tickner addresses some of the issues with Rushton and Wood's argument, namely their resounding criticism for David Warren Piper and Patrick Burke's Industrial Design course at Hornsey, which had an open-ended focus on critical problem-solving.[363] Rushton and Wood presented this course as failing to question the function of Industrial Design and simply serving the demands from the manufacturing industry by advocating flexibility and adaptability, which was misleading. Tickner mentioned the popular courses offered in therapeutic toy design for disabled children which was part of the broader 'design for need' philosophy which dominated the department in the era.[364] However, the intrinsic problem with Rushton and Wood's reading of Hornsey is in fact something shared with Tickner's account – the lack of value given to the creative production that characterised the sit-in on every level, from pedagogical design to campaign posters, performances and events. Furthermore, the ways in which

[362] See Barron, F. (1963), Harding, H. F. & Parnes S. J. (1962), Hausmann, C. R. (1975), Hausmann, C. R. & Rothenburg, A. (1976), Roslansky, J. D. (1970), Taylor, S. W. (1963)
[363] Tickner. *Op. Cit.* (2008) pp. 83-86
[364] Tickner. *Op. Cit.* (2008) pp. 88-89

the quality of the ideology produced by sit-in participants has been perceived and portrayed has meant that many important aspects of the Hornsey story have been glossed over, lost or under-valued in the shadow of the larger national policy debate.

3.2) The Conditions for Protest

David Warren Piper (speaking) and Alex Roberts during a sit-in meeting at Hornsey

i) The Hornsey Take-Over

In May 1968, when across the globe, social and political issues were confronted through protest and demonstration, the situation at Hornsey erupted as a group of politicised students and staff took over the building. The fine art curriculum has seldom made front-page news, but for a few brief months in the summer of 1968, it did just that, making the front page of *The Times*:

> 'Takeover At College By Students
> Several hundred students took over the main building of Hornsey College of Art at Crouch End last night and embarked on an all-night discussion of their grievances.'[365]

Hornsey gained reasonable currency with the press: young idealists fighting bureaucracy in order to establish control of their own education. The take-over itself evolved from a mass meeting in response to the bursar freezing student union funds. A group of students formed the Student Action Committee (SAC) in order to protest against these union funding issues and planned the one-night event. In 1968, Hornsey's studios and lecture rooms were scattered - it had no common rooms, the cafeteria was open only for lunch and consequently students and staff had few opportunities to meet collectively. In this context, the huge turnout for the meeting is understandable. Conversation quickly turned from the student union to more general concerns about the college and its syllabus. This was how the sit-in began.

While the sit-in was certainly informed and inspired by the ongoing protests by Paris students, Hornsey's grievances were idiosyncratic and extremely specific in nature. The Hornsey staff and students were protesting over the content and structure of the

[365] The Times Newspaper "Takeover by College Students" *The Times Newspaper.* 29 May 1968. p. 1

fine art and design curriculum, as well as the way this was managed within the Hornsey College of Art. Hornsey was amongst the few colleges that had been approved by the National Council for Diplomas in Art and Design to offer the new DipAD. The main changes to the curriculum were the introduction of the foundation year, early specialisation (students entered directly into their specialism in the first year of the diploma), compulsory Art History, and compulsory Complementary Studies. These changes minimised the exploration of different media, containing them within the foundation year so that the diploma was devoted to a single discipline like design, painting or sculpture.

The introduction of Art History and Complementary Studies was vitally important in terms of the Coldstream agenda: the desire to create an art qualification equal to a University degree. The student body changed beyond recognition, since acceptance was dependent, apart from in exceptional cases, on reasonable G.C.E exam passes. Students who failed to meet this academic level were directed onto vocational courses – practical courses which did not require you to undertake the compulsory Art History and Complementary Studies detailed for the DipAD. These vocational courses on the whole resembled pre-Coldstream art training – but they were devalued in comparison to the more selective DipAD.

Hornsey had always had a predominantly working-class attendance, but in the post-Coldstream period, this presence was in the main confined to the vocational courses. The class divide hinged on the issue of academic subjects: and hence Art History and Complementary Studies caused an institutional divide that was simultaneously a class divide.[366] At the same time, the student body were dissatisfied with the commercially-driven teaching approaches at Hornsey such as the focus on hard edge painting in the fine art department.[367] In a film made by students the year after the protest, they also described student projects built around design commissions which their teaching staff had received, using the students as unpaid labour to research and experiment around their brief.[368]

While Complementary Studies was an incendiary issue in itself, this compulsory course created space in the curriculum for contemplation of current affairs, interdisciplinarity, alternative histories and philosophies. It created space for discussion and for the formation of ideologies. It is no coincidence that a few Complementary Studies staff members were active participants in the sit-in; they were by far the greatest staff presence in the protest and this must be connected both with their own philosophies of pedagogy and to their relationship with the student body before the protest began.

As a curricular addition, it was little-understood and vastly varied, both within Hornsey and across the other UK institutions who had been granted permission to deliver the new DipAD. It was an open-ended area intended to enrich the creative process and to instil more rigorous critical engagement processes into the student experience. Unlike Art History, it appears that Complementary Studies was both a bone of contention and

[366] This divide was recounted by several ex-Hornsey students in interview with the author, including John Yeadon and David Page. (2006)
[367] Former Complementary Studies student John Yeadon and former Complementary Studies tutor David Page both recalled the hierarchical and ruthless manner of teaching in the fine art department. (Interview with the author, summer 2006)
[368] The Hornsey Film can be viewed at: http://archive.org/details/TheHornseyFilm

a catalyst, creating a more critical and politically-aware student body. I will examine the political stance of key Complementary Studies teaching staff, as well as documenting the issues created by the new subject in advance of the protest. In reviewing the relationship between the Complementary Studies courses and the politicisation of the student body, I hope to present a fuller interrogation of the sit-in, both in the context of the policy changes reviewed above and also within the pedagogical culture at Hornsey itself.

Over the following pages I will also give critical attention to the facets of the DipAD teaching practices which caused friction in the student body and which developed into a politicised stance to pedagogy during the sit-in. While the provocations of the protest – the academic content of the DipAD and the stagnation of values in studio practice – are widely acknowledged, why this was the case and how it impacted upon the student experience has never been explored. This chapter therefore, uses original interview material from former students and staff members which reflects their experience of teaching at Hornsey before the protest.

ii) Art History, Academic Equivalence and Class Division

'I would no more involve art schools in the history of art than surgical schools in the history of surgery'[369] John Ruskin

Art History was a problematic introduction to the fine art and design curriculum, standing for the division its inclusion forged between vocational and non-vocational art training. Art History was conducted principally within history departments in the

[369] Wedderburn, A. (2010) *The Works of John Ruskin, volume 16* .Cambridge University Press. p. 47

1960s, and it was from history departments that staff members were recruited to teach on the DipAD. The Coldstream Report recommended that:

'History of Art we think it will be generally accepted that an art training at the diploma level should include some serious study of the history of art. We recommend that the history of art should be studied throughout the course and should be examined for the diploma.'[370]

Art History was introduced, along with Complementary Studies, over the course of the 1960s. The nature of art and design training changed dramatically as moves were made to make the subject academically respectable.

The guidelines for Art History set out within the Coldstream Report were basic – Art History was to be continuously studied for the duration of the DipAD and it was to be examined. It was necessary to pass Art History in order to be awarded the Diploma. They did foresee that finding Art Historians suitably qualified to teach art students would create difficulties. Art History, itself undergoing a period of innovation and transformation, was still principally conducted within history departments in the 1960s. The new teaching staff had no experience of art students and the brand of Art History they provided certainly was not tailored towards the needs of the student body, as this ex-Hornsey student noted in 1969:

'I study industrial ceramics. This means I design and sometimes make plates, tiles, cups, and so on, for mass production….Now Art History is in general pretty irrelevant to the type of work which I am involved in. Of course, I could study Chinese patterns or Inca pots and obtain a few ideas which could be applied to my work. But the chance of doing this wasn't given to me, nor was any method of relating the history of art to my area of study. Every now and then we had to do a 'slide test'. We were placed in front of two tiny screens upon which were projected images of great paintings and buildings, nearly always interminable fifteenth- or sixteenth-century Madonnas. You were then expected to identify the paintings or sculptures or buildings, and compare

[370] Coldstream, W. (Chairman) (1960) *The First Report of the National Advisory Council on Art Education (First Coldstream Report)* Paragraphs 55 & 56

them with one another, expatiating upon their aesthetic characteristics and putting them in the right slots, e.g. 'Mannerism', 'Classicism', etc.'[371]

Slide tests according to DipAD students, were the dominant format of Art History teaching in the post-Coldstream period. Name, date and movement were the important considerations, achieved through memorisation. This formula for Art History is heavily dependent on access to adequate research facilities, but Hornsey's library facilities were poor – so Art History bred dissatisfaction both in the structure of the course and in the lack of resources supporting the course. The *Burlington Magazine* focused its November 1962 Editorial on Art History for Art Schools, and noted:

'We can only hope that the members of the National Advisory Council are right in believing that the sudden need for historians to fire the imagination of art students will be supplied by those universities and colleges which have, also quite suddenly, woken up to the idea that art can legitimately be investigated as well as practiced. But all this will take time and meanwhile the courses are to begin.'[372]

The *Burlington Magazine* rightly predicted the problems that the DipAD would cause initially for colleges trying to find suitable Art History teaching staff. To prove the point, seven years later the staff and student association at Hornsey noted that:

'Art History is only now coming out of its cocoon of pedantry, and the art schools should be most responsive to any new approach, sympathetic and innovating. The academic examination of Art History has wrecked the teaching of the subject in art colleges.'[373]

The staff and students of Hornsey argued that in order to be relevant Art History should, like art practice, be adapting and innovating, that it should be focused upon a student's work and interests, and that it should have different modes of examination. For one student, the lingering memory of Art History at Hornsey was this:

---

[371] AMHCA. (1969) *The Hornsey Affair*. Penguin Educational Specials

[372] Editorial. (1962) "Art History in At Schools". *Burlington Magazine*. no. 716, vol. CIV, November 1962. p. 452

[373] AMHCA. (1969) *The Hornsey Affair.* Penguin Educational Specials. pp. 95-96

‘a mittel-European voice would cry ‘Negst Schlide pleeasse!’, rapping on the floor with a pointer in time with the demand, and a bit of medieval foot would appear up there. ‘Identify, pleasse!’.’ [374]

This the introduction of Art History into Art and Design training was not a popular move initially. The majority of students and staff at Hornsey held the view, like John Ruskin a century before them, that creativity would not be aided by the study of art’s history. Inherent to this view was the assumption that art was about progress and that looking backwards does not encourage progress. In the short book of student and staff accounts of the sit-in, *The Hornsey Affair* of 1969, they proclaimed that:

‘We have tried to take the ‘r’ out of revolution and talk about evolution.’[375]

This statement reflected their desire for an education system that was continuously adaptive; they wanted to impose a system in which change operated as ongoing and developmental, forward thinking. The main argument put up against the study of Art History during the Hornsey sit-in was therefore its irrelevance in the eyes of studio staff and students.

The Coldstream Report did not recommend Art History to be made compulsory with the view of aiding the creative development of training artists, nor simply to contextualise practice. It recommended Art History in order to give the DipAD degree equivalence. Because Art History involved reading, memorising for exams and essay-writing in a conventional humanities model, it gave the DipAD the academic weight it needed to secure both funding and better prospects for its students. One positive outcome of the re-branding of Art and Design as academic subjects was indeed that DipAD students received mandatory grants on a level with university students.

[374] *Ibid.* (1969) p. 96
[375] *Ibid.* (1969) p. 76

However, the separation of the DipAD and the new vocational courses meant that the students on the vocational courses were considered non-academic and therefore did not receive grants. Additionally, the majority of the students on vocational courses were from less privileged backgrounds, had less money and had attended secondary modern schools in the local area, which on the whole did not produce the necessary GCE requirements for the DipAD. Art History, although inconsistently taught and ill-organised, won grants for the students who despised it so.

Hornsey students did not desire degree equivalence – but this did not mean that they thought they should not be issued grants. They believed the study of art to be unique, with little or nothing in common with traditional university subjects, but of equal importance nonetheless:

'To say that academic qualifications are almost certainly irrelevant to art education and that the literary-discursive character of university education is not the appropriate standard by which to judge art education is not to provide any basis for the conclusion that artistic and intellectual skills are, by nature, divisible and irreconcilable. This belief is shared alike by Summerson and Coldstream, and sometimes by ourselves.'[376]

They argued that the pursuit of art should be valued for what it was, and that changes implemented after the first Coldstream Report were backwards-looking and non-progressive. In the event, Coldstream and John Summerson largely supported their opinions. Summerson was, in 1968, responsible for the assessment of the newly designed DipAD courses. He openly supported the students during the protest and even visited the college during the protest for a question and answer session. The uniqueness of art, its separate and indefinable character, was one of the main problems that students had with the post-Coldstream quest for academic respectability. Art

[376] J.W et al. (1969) *The Hornsey Affair.* Penguin Educational Specials. London. p. 88

students did not want to be considered academics: they wanted to be considered artists. Nick Wright, who was then the President of the Student Association at Hornsey, describes this way of thinking as:

'…a diffused idea that art and design constituted a discrete activity within higher education and could legitimately be considered separately from academic or technical and scientific studies by virtue of the special character of art'[377]

In this 1988 article, Wright identified the belief in the uniqueness of art as one of the key pedagogical issues fundamental to the curricular reforms developed during the sit-in. The question of the uniqueness and individuality of art has, historically, made it difficult to systemise. There were a series of long-held assumptions about art-making that were just beginning to recede in the 1960s, all deriving from the common belief that an artist is born not made, that art is a talent not a skill, that technique can be taught but not artistry. Hornsey students trained at a difficult point in the history of art education: the curriculum was moving away from the cultivation of individual genius, but the hyper-controlled pedagogies of the 1960s created new concerns about production values, ownership and agency. Within document three of those released during the sit-in by the Hornsey staff and students, they stated that:

'We are victims of a historical balls-up

A system of education which once worked now only serves to deprive us of our needs. This traditional system when it worked was capable of evolution and adaptation to suit itself to changing needs. In this present age of unprecedented change we stupidly attempted the old technique of adaptation and reform. But the threadbare cloth can no longer be recut and resewn to fit the times.

Reform is useless

Rethinking is essential

The system is based on the departmentalisation and specialization of knowledge, and the latest attempted reform was the introduction of two new specialities, Complementary Studies and Visual Research. The latter has the slight advantage of being more relevant to a school of art than the former.

377 Wright, N. (1988) "What Happened At Hornsey". *AND Journal of Art.* No. 17, 1988. p. 44

These two new specialities, like patches of new cloth sewn into the old threadbare material, have finally torn the system apart. THE PRESENT APATHY in the schools, especially noticeable since Christmas, is the mirror of our despair and final disillusion.'[378]

The Hornsey students presented the introduction of Art History and Complementary Studies as a poor attempt at reform in the face of a failing system, arguing that they did not believe that these new subjects alone could make the DipAD a qualification that would help them get jobs through the attainment of transferable skills and knowledge. Rather, Hornsey students saw that the core transferable skill that an artist could offer was that which was attaining a cult-like following and reverence: creativity. Creativity was the ultimate currency; the ultimate transferable skill; it stood for the ability to instigate progress. In *A Source Book for Creative Thinking*, published in 1962, H.F. Harding and S.J. Parnes argued for a more creative focus in education, with a long-term view of supplying science and industry with innovators. Within a broad discussion of primary education they write:

'A creative person tends to change the function of materials he uses. He may use a piece of steel wool, for example, not for pot-cleaning but as the beard of a puppet.'[379]

This rather simplistic example illustrates a trend in educational theory towards giving creativity a definition of transformation and innovation. The same publication lists key attributes of the creative individual as fluency, flexibility, originality, ability to define and rearrange, analysis, and coherence of organisation.[380] All of these skills appear to hinge on the ability to recognise, adapt and improve patterns in material, products and

[378]AMHCA. (1968) *Document Three.* June 1968. Hornsey College of Art Archive, the University of Middlesex.
[379] Harding H.F & Parnes S. J (Eds) (1962) *A Source Book for Creative Thinking*. Charles Scribners & Sons. P. 13
[380] *Ibid.* p. 234

experiences. Creativity, in its growing currency, was one transferable skill that could be applied to art and design practice in an era of instability, subjectivity and the loss of boundaries.

In the 1960s creativity had amassed an educational literature which positioned it as progressive, individual and above all novel. To be creative was to innovate – the introduction of Art History, as a subject that was taught as a retrospective, was considered anti-creative. This was an aggressively modern stance: that creation took place at the cost of destruction of history, this being the price of progress. Educational theorists were, in the mid-1960s, just beginning to suggest that the cultivation of creativity in schools and universities was vital not only for personal development but also for innovation and invention. Over the following two decades, a body of literature emerged that both described what creativity was and how it was beneficial across all academic subjects and all industry.[381]

History was not, in the opinion of Hornsey students of 1968, creative, because creativity was progressive. This concept was later reflected by C. R. Hausman, in his *Discourse on Novelty and Creation* of 1975. He expressed the commonly-held belief in the relationship between creativity and the new: a new object, idea or text is identified by its disconnection from all that has come before it:

‘First of all, it should be evident that a created object exhibits a complex structure that is new and unprecedented and unpredicted. It appears to be unaccounted for by antecedents and available knowledge, and it is thus disconnected with its past. In this sense it occurs in the midst of discontinuity.’[382]

---

[381] See Barron, F. (1963), Harding, H. F. & Parnes S. J. (1962), Hausman, C. R. (1975), Hausmann, C. R. & Rothenburg, A. (1976), Roslansky, J. D. (1970), Taylor, S. W. (1963)

[382] Hausman C. R. (1975) *A Discourse on Novelty and Creation.* The Hague, p.9

This modernist concept of creativity as progress and history as something to be replaced was maintained and further developed in the 1960s and 1970s, despite the more subjective theories of postmodern cultural production which emerged in the same period.[383] Given the issues identified earlier around the foregrounding of the avant-garde and the lack of consideration of the postmodern in art school teaching, the presence of 'creativity' as a kind of modernist concept in educational theory holds significance. It was certainly at the heart of the Hornsey protest, as students pitched theoretical and historical studies as limiting – or even damaging – the innovatory power that was creative practice.

However, fortunately for future generations of art students, once the course had been running for a decade or so it began to supply its own demand since as Coldstream had predicted, after the DipAD had been running for a few years, it created a supply of staff. Out of those same students who were amongst the first DipAD graduates and disliked the Art History lessons, many of their number found work teaching Art History and Complementary Studies for the DipAD in years to come. The majority of Hornsey students who I interviewed had, at some point in their career, been involved in teaching of one kind or another – Art History, Complementary Studies and Studio Practice.

iii) Criticism Culture: Practice at Hornsey before the Protest

Despite the criticisms levelled at Art History as prohibitive to the openness of creative practice, there was much dissatisfaction about studio practice too. The student

[383] See Barthes, R. (1968) & Lyotard J. F. (1979)

experience of the criticism system at Hornsey gives an interesting insight into the inherited values of abstract form that passed from Basic Design to the DipAD curriculum. The group criticism has formed an essential element of fine art training since the mid-twentieth century; an open forum of sharing and debate through which students are intended to question their ideas and develop critical approaches to practice. The recollections of Hornsey students reflect a criticism system that was hierarchical and profoundly biased in terms of favoured styles, perhaps unsurprising in light of the restrictive – and often prescriptive – teaching methods around abstraction at foundation and first year levels. Former Complementary Studies tutor and Hornsey participant David Page commented on how the system should work:

‘In the crit system…there has to be a group ethos that we are in this to improve, and none of us (staff or students) are exempt from reasoned criticism.’[384]

Prior to the events of May 1968, a criticism system was in place that was somewhat aggressive: both in terms of the treatment of students, and the aggressive promotion of certain practice ideals. The teaching of art practice at Hornsey was not far altered by the Coldstream reforms and the introduction of the DipAD, aside from some time being taken up by the new subjects. The students were allocated a small corner of studio space in which to work and their practice was monitored by individual discussions with tutors and the group criticism system, sharing work with contemporaries and teaching staff and receiving feedback in a public forum. Hence their work was assessed collectively and its success was measured by the collective reaction as well as the tutor’s final judgement when marking.

[384] Sloan, C. L. (2006) *David Page: Responses to Questions by Email.* 27th July 2006

The Fine Art staff at Hornsey was split between fashionable painters and sculptors who had considerable success in commercial galleries, such as Hubert Dalwood and Mike Tyzack, those with conventional painterly interests such as Jack Smith, Keith Grant, and David Page and those who were involved with experimental work such as Stuart Brisley and Dante Leonelli.[385] They were selected, as was the standard, for their success as artists rather than as educators. The teaching methods in art were largely limited to conversation; the discussion and criticism of ideas. The main reason for the selection of reasonably well-known practitioners was building Hornsey's reputation: the college was at the peak of its success. Hornsey was portrayed by its PR department as a hotbed of talent, success, style, creativity, and glamour. In the 1960s art and style overlapped aesthetically to an unprecedented degree and the collision of the two in schools of art and design gave the colleges a new cool status in emergent popular culture. It was also the heyday of art school rock, as highlighted in the prior case studies where students included Bryan Ferry, Pete Townsend and Freddy Mercury.

However, over the course of the year prior to the sit-in a kind of creative apathy had settled over the student body. They were not experiencing the fast exchange of new ideas, the creative explosion that the PR department had projected upon them: rather they found themselves caught somewhere between the hierarchy of styles and ideas that were promoted by their tutors. Of course, there was not complete agreement between the staff as to what styles and ideologies deserved high marks – but some individual opinions mattered to the students more than others. As a predominantly figurative painter, ex-student John Yeadon had to fight his corner throughout his time

[385] Sloan, C. L. (2006) *Responses to questions by Email, David Page and John Yeadon.* July 2006.

there, but maintains that this was good for him. However, certain favoured styles and ideas had remained dominant in Hornsey for too long, and this was limiting experimentation. Yeadon recalls that:

‘The work at Alexandra Palace (Hornsey’s fine art dept.), though varied (figurative, landscape, abstract, pop etc.), fell into a hierarchy…i.e. minimalism at the top, the painting that commanded high grades was ‘hard edge’ painting and minimal sculpture was dominant, it was ‘trendy’.’[386]

The styles and movements listed above have a clear trajectory from the Basic Design ‘grammar of form’ approach, and it must be noted that these ideals would have been the backbone of the training received by teaching staff at Hornsey. Furthermore, Basic Design ideals fed into the development of the DipAD through the contribution of key practitioners, thereby embedding a grammar of abstract form into the curriculum. However, what the first Coldstream Report did not account for was the decline of abstraction. Given that the notion of a grammar of form was evolved in the mid-1950s, by the late 1960s, when the first DipAD students were due to graduate, abstract painting was no longer at the cutting edge of art practice. Hornsey students were training at a transitional time for the visual arts. It was the end of the 1960s and minimalism had already peaked, and in a sense it was the last modern movement: the last distinct practice of traditional painting and sculpture dominated by a strict ideology.

The open criticism system in operation was heavily influenced by the styles and techniques favoured by staff. Succeeding at the DipAD really was a matter of courting the current trends – David Page notes that:

[386] Sloan, C. L. (2006) *Interview with John Yeadon: Responses to Questions by Email.* 29th June 2006

‘A student could get as far as finals, put up a display of competent paintings whose subject-matter happened to be Che Guevara, Castro, etc., to be told that his work was really graphic design and be failed. (actual case).’[387]

Hard edge painting styles and sculpture with a minimal look were positively received within the college - it was a respected and fashionable look, and it drew high marks for its student practitioners, in the same way it drew high prices for their teachers within commercial galleries. Thus the 1960s generation of training artists inherited geometric abstraction, constructivist ideals, a grammatical approach to abstract form. Hard edge abstraction, Minimalism, and all reductive tendencies in western art have had a clear and extensive impact on art practice since, from the aesthetics of display to the formal consideration of the viewer’s physical experience on the part of the artist.

A clear and definable hierarchy of style and process existed at Hornsey, according to ex-students. Hornsey was a fashionable institution and as such, it drew its standards from what was current and successful. Former student Tim Jones notes:

‘Before the sit-in Hornsey was one of the most (the most?) fashionable art schools in London and the art work seemed to me largely within the conventions of what was in fashion. Much more radical art came to the surface during the sit-in.’[388]

Yeadon recalls that:

‘In those days when looking at work lecturers would say things like “shit”, “rubbish” and walk away or “I’ve been in that bag and there is nothing in there”…Many of us who experienced this came to believe in a supportive and positive critical approach when we began to teach ourselves.’[389]

This dismissive approach to student development has an emphasis on the ability of the tutor, as expert, to judge the integral value of the work. It is certainly hierarchical in

[387] Sloan, C. L. (2006) *Interview with David Page: Responses to Questions by Email*, 27th July 2006
[388] Tim Jones, Responses to Questions by Email, 6th July 2006
[389] Sloan, C. L. *Interview with John Yeadon: Responses to Questions by Email*, 29th June 2006

philosophy and it therefore certainly would have impacted upon the culture of production in the college. David Page remembers that Roger Law, the creator of Spitting Image, was teaching at Hornsey in the 1960s. He was famous for dismissing student's work in this manner, but they didn't particularly take it to heart:

'...they didn't seem to mind his incoherencies (afterwards he said he hadn't had an idea how to teach) because he was very generous with time and help, and a compelling benevolent personality. In the end teaching is an art: you try to construct systems that work, or that prevent abuses, but it does come down to skilled people of goodwill and generosity who want to help others and are good at it.'

The communicative possibilities of hard edge abstraction were limited, but the students were working in a system of favoured styles and ideas. Perhaps, here again, is a frustration that contributed to the explosion of energy and activity that was the sit-in. However, when the sit-in began, there was an explosion of opinions and ideas at Hornsey. What all the individuals I interviewed had in common was the conviction that the six weeks of the Hornsey sit-in saw more innovation and creativity than there had been for the duration of the DipAD. There was exciting experimentation with early performance work, light and sound, installation. There was also, of course, significant production of demonstration posters and flyers. Hornsey was a hive of activity – and for the first time there were no barriers between departments – they were experiencing the network system for which they were campaigning. They felt they were working together, in a space of free exchange.

iv) Complementary Studies & the Political Contextualisation of Pedagogy

In this section I will assess the ways in which Complementary Studies contributed to the politicisation of the student body at Hornsey, with particular reference to two very active lecturers, David Page and Tom Nairn. The Complementary Studies department was particularly noticeable in its support of the protest, an interesting fact in light of the role of the subject in the DipAD curriculum. The presence of Complementary Studies staff was evident from the outset; the Association of Students of Hornsey College of Art was formed on the first day of the sit-in but by day two, staff members had also begun to register their support for the action. The name became the Association of Students and Staff, and later, Associated Members of the Hornsey College of Art (AMHCA). However, this name has a misleading air of institutional unity about it: in truth the staff members were few and the majority were lecturers from the Department of Complementary Studies. Considering that the introduction of Complementary Studies was the vaguest and least understood of the Coldstream reforms, the apparent bond with the student body seems curious. However, given the liberty around the subject the Complementary Studies staff members out of all the teaching staff at Hornsey, had the most open opportunity to bond with the students.

This issue of Complementary Studies and the sit-in has not been fully addressed to date, although the ruptures caused by the first generation of post-Coldstream University-educated "General Studies" staff in advance of the sit-in was addressed by Lisa Tickner.[390] The Coldstream Report provided no guidelines at all for Complementary Studies aside from the statement:

'Complementary Studies. All diploma courses should include Complementary Studies. By this we mean any non-studio subjects, in addition to the history of art, which may strengthen or give breadth to the students' training'[391]

---

[390] Tickner. *Op. Cit.* (2008) pp. 72-75
[391] Coldstream, W. (1960) *First Report of The National Advisory Council on Art Education* (The First Coldstream Report) paragraphs 25 & 26

In the mid-1960s, art schools approved to teach the DipAD began to advertise across the country for staff to teach the new Complementary Studies courses, with Hornsey advertising for a generic lectureship in the Times Educational Supplement:

'Lectureship, Hornsey College of Art, Crouch End Hill, London N8'[392]

It was a new concept; recruiting staff from other disciplines to inform and complement art. The colleges were unsure of the responses they would get, but they found themselves with a steady supply of young graduates with some teaching experience, mainly drawn from literature or the social sciences. They were informed that the subject they were to teach was undefined but compulsory and they were given the freedom to formulate their own curriculum drawing from their own backgrounds.[393] Not only were the new staff free to create their own courses, but they were also free to assess the work of their students: the Coldstream board had recommended that the subject should be internally assessed.

At Hornsey, the Complementary Studies staff entered into an atmosphere of frustration, where the DipAD was considered the source of all Hornsey's troubles. The new elements of Art History and Complementary Studies were the most despised since they were the academic subjects and were thus responsible for the division and inequality between vocational students and DipAD students. They were viewed not only as unnecessary, but also as divisive and unfair. As well as this general atmosphere of resentment and discontent, there was confusion: nobody, not the staff members who were to teach the classes nor the students who attended the classes, knew precisely

[392] The Times. (1967) "Advertisement for teaching Staff". *Times Educational Supplement*. 1967
[393] Sloan. *Op. Cit.* (2006) *Email exchange with David Page.*

what the subject was or how it fitted within the studio-led curriculum of a fine art education.

The DipAD was, on the whole, quite structured. Students chose a discipline, and developed skills in this discipline for three years, aided by the traditional criticism system that had been in operation since before the introduction of the DipAD. They attended Art History lessons, where they were shown whichever slides the lecturer had selected and where discussion was limited to ‘name, date, style, subject, movement’. And finally, they attended a weekly class in Complementary Studies – and it was here that they essentially entered a curricular vacuum. The head of the Complementary Studies (or General Studies) department at Hornsey was David Joseph. Joseph was not involved in the sit-in but he did not verbally condemn it like the other departmental heads, leading to him being excluded from meetings over the summer.[394]

In order to fulfil their role, the Complementary Studies staff had to find a way to fill this vacuum, but they first had to find ways of engaging a hostile student body. Two of the Complementary Studies staff members who were involved in the Hornsey sit-in have contributed recollections and observations to this thesis. Firstly, David Page, who recalled in an email exchange that:

‘The point about Art History and Complementary Studies…was that nobody had the vaguest idea what Complementary Studies was supposed to be, so you could make it up as you went along….I taught my students comparative literature, so they read *Waiting for Godot, The Caretaker, Sgt Musgrave’s Dance,* etc., and I tried to get them writing and so on. I even gave them a class on the elementary cooking of rice, as many of them were living on their own and failing on the domestic front.’[395]

[394] Tickner. *Op. Cit.* (2008) pp. 72-3
[395] Sloan, C. L. (2006) *Interview with David Page: Question Responses by Email*. 27th July 2006

There were no restraints in place, no suggested materials, no defined educational targets. Page was free to teach as he wanted and as a graduate of literature, he mainly taught comparative literature to his students. Although Complementary Studies has not survived until today as a set subject, it certainly has as an ethos within fine art training – students are encouraged to make connections across disciplines while undertaking their 'creative research.' Complementary Studies, according to Page, was born from Coldstream's desire to offer art students further intellectual development:

'When I spoke to Coldstream about it he said mainly that when he arrived there was hardly a decent library in any Art School. He just wanted a broad intellectual improvement.' [396]

Coldstream anticipated that this intellectual 'improvement' could be achieved through the acquisition of general knowledge and acquaintance with other arts; in short a curriculum system that would create cultured artists. The subject had been created with the DipAD and alongside Art History. It was intended to give the qualification its academic clout through the pursuit of traditional modes of study.

David Page had also studied literature at Oxford, but had been a keen painter since childhood. Before starting at Hornsey, Page had spent a year in St Ives, painting, and had exhibited at the Penrith Gallery in St Ives, as well as with the London Group. A friend suggested that teaching Complementary Studies would be a good compromise for an artist who had not trained and who desired a career in art; Page could use his literary background whilst teaching within a school of art. Page recalls that he saw that there was potential in Complementary Studies but not as a bolt-on subject, because

[396] *Ibid.* (2006)

this made it too separate and unrelated to the student's practices. He was frustrated by the non-integrated approach at Hornsey.

Teaching Comparative literature was no doubt the kind of complementary subject that the Coldstream board had in mind. (However, it is doubtful that elementary cooking would have been considered complementary to fine art training). Page, in providing the students with elementary cooking classes, implied a concern for their welfare but he also delivered the kind of teaching that the Coldstream Board had anticipated – the provision of culture, knowledge of comparative literature, the ability to articulate ideas through discussion and writing. These are all skills necessary in the study of humanities and social sciences, where academic training is equally about both the analysis of material and the creation of material. Before the introduction of Art History and Complementary Studies into the British schools of art, this discursive and critical training had not been a priority for training artists.

David Page played a supportive role in the sit-in itself. The paternal attitude reflected in his decision to offer basic cookery classes extended beyond measure against the backdrop of the protest. When space was short, he surrendered his office to students. When leases on term-time lets ended and the last of the grant money was spent, he also opened his home to the students, and a commune formed in his house on Hanley Road. Philip Maltman, who was eighteen in 1968, had just been accepted onto the DipAD at Hornsey. In his interview for a place, he was asked what he would do if he was not accepted and he said he would apprentice himself to Picasso. In the event, he served an apprenticeship of a different kind, arriving in the summer and becoming involved in the sit-in. He was invited to Hanley Road by one of the other students, Frank Hallam, and remained there for most of the summer. He recalls:

'Living at Hanley Road was sleeping on the floor upstairs with about 10-15 others (that many? It seemed like it), grabbing toast and tea in the morning after being woken up by BBC panorama or German or Italian TV for interviews.'[397]

Maltman was a bit of an outsider, not having started his studies yet. He was put to work, printing and delivering posters and organising fundraising events. At night he returned to David Page's house, where he and several other students ate, bathed and slept.

A second very active presence at the protest from the Complementary Studies department was Tom Nairn - he graduated from Edinburgh in the late fifties with an MA in Human Philosophy, and then went on to study literature at Oxford under the supervision of Iris Murdoch. However, he never finished at Oxford – instead he left and began teaching in London. Since then, Nairn forged a career as an eminent scholar in the field of nationalism and maintained a Marxist position for much of his career, until recently. From 1962, Nairn was deeply involved with the production and content of the *New Left Review*, and wrote a number of articles that were published within it. Nairn's own political stance was profoundly socialist while he was teaching at Hornsey, an interesting fact in light of the politicised written material and posters produced during the sit-in.

[397] Sloan, C. L. *Philip Maltman interviewed by the author: Question Responses by Email,* 22nd July 2006

When the Complementary Studies staff, with their social sciences and humanities backgrounds, set about understanding the activities and interests of their students, forming comparisons with their practices and other art forms and creating social contexts for art training, it may well have been the first time that the Hornsey Art and Design students had been asked to confront the function and success of their activities in any kind of larger context. Tom Nairn writes within the first pages of *The Hornsey Affair* that:

'Our wares were invisible, and could only be 'got across' at all by breaking down the class barrier – by 'stirring up' the minds of the students to some extent, by provoking a modicum of self-activity. This meant that we were forced to identify ourselves with them and their interests as human beings. We could hardly help becoming class renegades, and even forming an alliance of sympathies against the régime. Naturally this was fatal to the régime, and to us.'[398]

Perhaps we could simply accept that the Hornsey students, as independent and creative young people, planned and carried out the protest in line with their New Left political beliefs. However, there are a few points that disprove this idea. Firstly, there were no other events prior to the protest where students discussed either political issues or their own educational issues in a student-organised context. The sit-in was the first action taken. Secondly, the sit-in evolved from a separate event – a meeting planned by the Student Action Committee to address the issue of withdrawn Union funds by the Bursar. Thirdly, this Student Action Committee was formed in reaction to the Bursar freezing the Union funds and did not exist prior to this. The initial committee consisted of six individuals from the entire student body. The six members were extremely surprised when nearly the entire student body turned up for their inaugural meeting. Again, one could be cynical here and conjecture that a student community with no social spaces aside from a limited-hours cafeteria, with buildings spread across a ten

[398] Tom Nairn et al. (1969) *The Hornsey Affair.* Penguin. London. p.19

mile radius and no regular social events would be grateful for any opportunity to gather together.

Furthermore, it was the 28th of May 1968 and Paris had been in chaos for a month while student protests raged across the city and made headlines across the world:

Figure 99: May 1968 Poster. *Paris: Be Young and Shut Up.*

This poster (Figure 99, above) was one of many that appeared on the streets of Paris: its slogan translates as 'Be Young and Shut Up'. It portrays a young man being silenced by the silhouetted caricature of Général de Gaulle, the then President of the French Republic. The initial student protests escalated into protests by ten million students and workers across France, fighting a heady mix of left-wing causes, communism and anarchism. It was to be a year of student protests worldwide. In the south of the United States in February students had protested for equal rights and three black students were shot dead. By the autumn, violent student protests had taken place in Mexico, leading to the massacre at La Plaza de la Tres Culturas in Tlatelolco in Mexico City, on October the second.[399] It is safe to say that there was revolution in the air in 1968.

The Hornsey protest was revolutionary in tone from the outset – it mixed its terms somewhere between art curriculum reform and social justice. In the statement issued on the 28th May the association of students and staff stated that:

‘The student action committee calls upon all colleges of higher education, universities and student bodies to support us in the efforts to establish a real and genuine system of education in this country – to enter into dialogue with our educators, to petition the authorities for the active participation of students throughout the country. Students are not children and the strength of our appeal stems from a wish to be free of the doctrines which up to now have placed those wishing to advance intellectually in an inferior social and economic strata’[400]

So, from the beginning the Hornsey protestors were campaigning not only for change in their own institution, but also national change. They also set their protest in the context of education as a social issue. Perhaps this was again indicative of the influence of Complementary Studies, in terms of placing the study of art within a wider framework. In this case, the given context for their actions was education and social change, informed and inspired by the ongoing revolutionary movements in Paris and worldwide.

As noted, a nearer source of revolutionary inspiration was Tom Nairn. There is no doubt that Nairn is an individual with strong political opinions – and in the 1960s he

[399] Caute D. (1988) *The Year of the Barricades*. Harper Collins. London.
[400] AMHCA. (1968) *Document One,* 28th May 1968

was a self-professed Marxist, a socialist, an advocator of the New Left. In the early 1960s he had developed a theory about the development of power in the UK that later brought him to prominence in his academic career. Known retrospectively as the Nairn-Anderson Thesis, the theory takes the form of a body of articles published in *The New Left Review* in the early to mid-1960s.[401] Nairn was interested in the development and exchange of power, from a socialist perspective.

The dominant concern of the Hornsey protest was the relocation of power from a hierarchical system where the curriculum was dictated, to a system where students had the power to control their own education. Nairn disliked hierarchical systems – he had a deep interest in revolution and the power of the collective to create change. His views on hierarchy extended to traditional, essentialist modes of education where the teacher, as holder and transmitter of knowledge, had an elevated position. He thought, just as the students asserted during the sit-in, that individuals should have the authority to direct their own education. He was delighted by the sit-in, and proclaimed it:

‘the profoundest educative experience for those who participated, teaching them more about themselves, their relationships and their work than the normal four or five years of higher semi-education.’[402]

He also stated that:

‘The best way of finding out about the world *is* to turn it upside down. No revolution not done for its own sake, for the joy of discovery and creation, can be worth doing, or can succeed.’[403]

---

[401] See Nairn, T. (1965) “Labour Imperialism”. *New Left Review.* I/32. July-Aug 1965; Nairn, T. (1963) “Landed England”. *New Left Review.* NLR I/20. Summer 1963. pp. 116-119; Nairn, T. (1964) “The British Political Elite”. *New Left Review.* NLR I/23. Jan-Feb 1964. pp. 16-25
[402] Nairn, T. et al. (1969) *The Hornsey Affair.* Penguin Educational Specials. London. p. 1
[403] *Ibid.* (1969) p. 1

He believed in revolution for the sake of revolution – it was a creative act for him, an act of discovery and progress. Hence the troubles at Hornsey were reason enough for a take-over. The students wrote in their first statement that they were:

'… not primarily demonstrating their dissatisfaction with the existing system, although this is a major implication of our action, nor are we hoping for the benevolence of the educational authorities, but we are actively and democratically participating in the construction of an educational ideal – the right of rational young men and women to have a say in the education they receive and through which their individual and collective needs and aspirations must be met.'[404]

While at the outset it was revolution for the sake of revolution in the sense that the Hornsey students initiated the action with no defined purpose aside from change, the direction of the protest evolved swiftly. The educational system in place caused dissatisfaction: therefore the Hornsey staff and students undertook a revolution to change it. The very fact that members of staff were collaborating with students in this undertaking made it a new educational experience, as traditionally the power to make decisions and formulate plans lay entirely in the hands of the tutors. This time, the students initiated action and the tutors colluded.

In order to create a class that in any way fulfilled the Coldstream specification of complementing the student's practice, it was first necessary to engage with the students. This point is vital to our understanding of the relationship between the students and the Complementary Studies staff – it was the only subject where the students were encouraged to think about what it was that they were doing, and what it was that they wanted to achieve, to form comparisons, and to put their work in context. Complementary Studies, the vacuum in the grid, gave students a chance to formulate their position and express their opinions. The power of protest relies on these

[404] AMHCA. (1968) *Document One.* 28th May 1968

opportunities for a collective to express similar concerns. The small revolution that was Hornsey needed proximity; it needed collective discussion and shared experiences, in order to get started.

The Hornsey students did not want entire control: they wanted to work in collaboration with their tutors, stating in document one that:

‘We are demonstrating that it is entirely possible for a body of students to take over (and) properly organise in co-operation with our tutors a curriculum in which individual needs are no longer subordinated to a predetermined system of training….’[405]

The sit-in was not about leadership – they wanted a democratic system where individual needs would be met through staff-student collaboration. Again, it is clear that the issue of the relocation and even dispensation of power was at the heart of this rebellion. Nairn said after the sit-in that:

‘Everybody knows that, whatever comes out of it all, the old monster can’t be restored to life. This irreversible quality makes me hopeful. Premature revolutions (like the Paris Commune of 1871) are devoured by the monster, and vanish as if they had never been. Where the monster vanishes, the time *must* be ripe.’[406]

The monster he describes is evidently the system; the systems of art education at Hornsey and in the UK. Nairn was lyrical in his descriptions, and he had clearly placed Hornsey in the context of other revolutions, educational and social, throughout history. All of the worldwide protests concerning education had, that year, been framed in the context of social change: students wanted educational reforms that would allow students to direct their own education and create equal access for everybody. They also, however, wanted education to actively cultivate a fair and equal society, though its structure and its teachings. They wanted a system that could adapt to meet the needs

[405] ASSHCA. *Document One.* 28th May 1968
[406] Nairn T et al. (1969) *The Hornsey Affair.* Penguin Educational Specials. London. p. 25

of individuals, and therefore meet the needs of all. In an international context, these issues were intrinsically tied to issues of employment, race and civil rights.[407]

Hornsey wanted a system of equality between staff and students, equal within the student body itself, and absolute equality in terms of choices and progress. The central problem with a perennialist attitude to education is that we do not start equal. Individuals have distinct needs and desires, distinct histories, and they progress at different rates. Simply suggesting that learners have the freedom to formulate their own education is idealistic and also problematic: in order for such a system to work, there needs to be provision (financial, educational, geographical) for every eventuality for every individual simultaneously. Of course, this does not mean that staff and students cannot protest against the same issues side by side – but it does raise certain issues as to how the teacher-student dynamic was played out during the Hornsey protest. I would suggest it was played out collaboratively; the high confidence of the young encouraged, and directed, by individuals who had been employed to put art practice in context.

Both Page and Nairn were promptly sacked after the sit-in finished. Nairn said the following year that: 'We are blamed for the whole upheaval now, at both Guildford and Hornsey.'[408] It is true that the Complementary Studies staff gave the students the impetus to articulate their grievances more clearly, through trying to improve communication within the seminar room. This, coupled with the frustrations

[407] Caute. *Op. Cit.* (1988) pp. 3-12

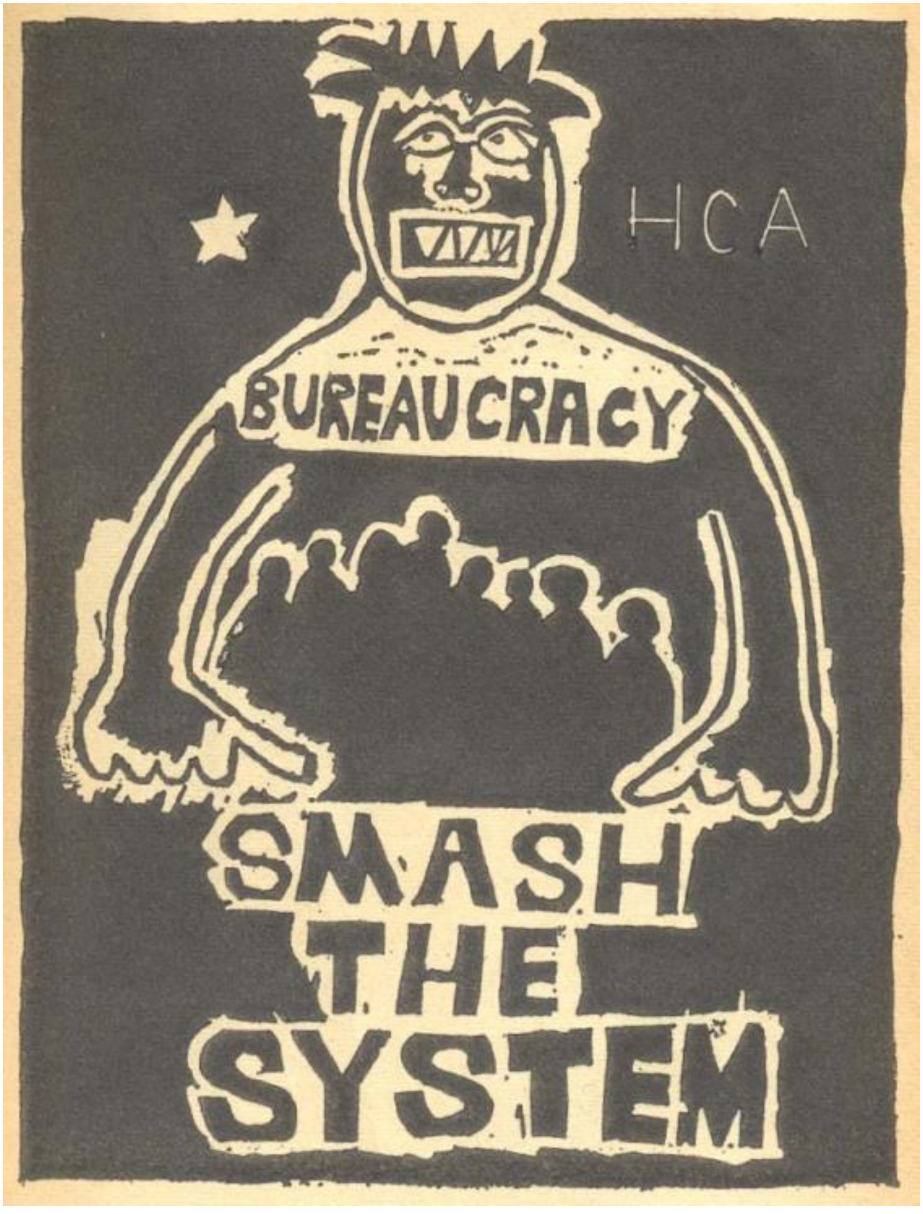
[408] AMHCA. *Op Cit.* (1969) p. 16

experienced by the staff over their undefined position, began the discourse that would lead to the protest. It is clear that Complementary Studies can be attributed with creating the conditions for protest, but it must also be remembered the participation of Complementary Studies staff members were actively involved in a protest which threatened their own careers. They actively supported the student's decisions and protested by their sides. The following year, both Page and Nairn were on the board of editors of the book published by Penguin about the sit-in *The Hornsey Affair*, creating an enduring legacy of a pedagogical event which transformed the educational experiences and interests of all involved.[409]

[409] AMHCA. *Op Cit.* (1969)

3.3) Control:

System Disruption and Culture Jamming as Pedagogical Protest



AMHCA. *Campaign Poster, Hornsey Protest*. Linocut. June 1968

i) Control and Systems Pedagogy

The purpose of this chapter is to re-evaluate the material outcomes of the Hornsey protest in order to draw out the broader significance of networks and systems in shaping the philosophy of education evolved by participants. This is both in terms of the negative associations of ‘the system’ within liberal politics and the ways in which participants reclaimed systems philosophy in order to subvert it. This chapter draws upon critical pedagogy and concepts of culture jamming in order to explore the issues of control and agency within the pedagogical debates at the heart of the protest.

During the Hornsey Affair, systems and structures were the subject of criticism, suspicion and extended discussion. They were used as a metaphor for the crushing power of bureaucracy and Hornsey College of Art’s administration was treated as the point where the various structures of national policy, council authority and DipAD validation collided. The college was rife with the visual language of Communist protest, the campaign posters echoing the style of the iconic images created in Paris which appeared in the press across the world. Given the extensive systems content of British art school pedagogy of the 1950s and 1960s, the language of protest employed here is particularly pertinent. Statements on the Hornsey posters, called to ‘smash the system’ or ‘overthrow the feudal system of conventional education’, clearly implying that ‘the system’ was a restrictive set of power relations, within which students and staff had limited agency.

While the Hornsey Affair has until now been read in the context of the restrictive curricula of the new DipAD, it is also important to note that even the most radical pedagogies of the 1950s and 1960s had a philosophy of staff-led experimentation, with students treated as specimens within this system. While it was a liberal period of art school teaching staff, it was not so for the students. In the previous two case studies, each pedagogical approach featured controlled models of pedagogy in the art school; firstly Basic Design, which dictated outcomes with little interest for individual intervention into process. Basic Design exercises, particularly those developed by Pasmore and Hamilton at King's College, were not starting points for students. They were fully-conceived processes involving planned interventions and decided outcomes. Underpinned by the notion of a grammar of form, they dictated the material and conceptual limits for the students.

Ascott's Groundcourse took this further, incorporating behaviourist approaches within which teachers were in control and students were the objects of an experiment in cybernetic pedagogy. The behaviourism of 1960s art school pedagogy, as discussed earlier in this thesis, incorporated unsettling elements of surveillance and control.[410] The Hornsey sit-in should be understood in this broader context of staff-led exercises in the British art school, out of which the basic tenets of the DipAD were evolved. Pasmore played an instrumental role in the first Coldstream Report and Ascott was on the panel for the second, with many of the other pedagogues discussed within this thesis contributing to one or the other. This demonstrates that the radical pedagogies of the era did not operate outside the system but in fact, their instigators made active contributions to educational policy.

[410] See Groundcourse case study, *Interactivity and Behaviourism.* p. 249

While the DipAD formed the focus of the Hornsey protest, it was built upon the same values of controlled pedagogy which had evolved since the end of World War II. Perhaps the most interesting aspect of the protest then is that staff and students did not abandon learning and simply occupy the college; rather they continued to operate as a school of art, offering classes, seminars and debates as well as visiting speakers. In addition to this, many of the tasks of the protest such as pedagogical design and the production and circulation of protest posters were carried out in a spirit of cooperative unity involving students and a small number of staff members; they had a definite sense of project work about them. This was not principally an anarchical form of protest but it was subversive in that it took an existing model of operation and changed the balance of power within it. This was a very efficient way to highlight the perceived deficiencies within the existing system. It has echoes with 'culture jamming', a form of social protest or pedagogy, which David Darts describes as follows:

> 'Although the term "culture jamming" was first' used in 1984 by the San Francisco audio-collage band Negativeland, the concept 'itself dates back to the suffrage and avant-garde movements of the early 20th century. These radical artists and self-described social agitators adopted sociopolitical issues' as their primary focus and challenged dominant conceptions about art and artists, directly confronting the rigidity and hierarchical superiority of the art institutions.'[411]

Darts is an artist and scholar and he has written about and performed acts of culture jamming and other alternative pedagogies. 'Culture Jamming' takes its name from radio jamming, the practice of pirating public frequencies in order to subvert them for an independent broadcast, or purely in order to disrupt the mainstream. Culture jamming, therefore, takes dominant social and cultural ideas, imagery, and concepts

---

[411] Darts, D. (2004) "Visual Culture Jam: Art, Pedagogy, and Creative Resistance" *Studies in Art Education: A journal of Issues and Research.* 2004. 45 (4) pp. 313-327. p. 320

and attempts to subvert their meaning through action; it is principally an avant-garde philosophy characterised by close mimicry of the cultural form the protagonists wish to subvert. The philosophy and direct aims of culture jamming are often educative, and nearly always rooted in a socialist critique of contemporary culture.

With a close relationship to memetics, culture jamming relies on the notion that certain ideas, or memes, are collectively recognisable and signify an accepted cultural idea. The subversion therefore operates between familiarity and difference, creating shock or confusion in the targeted audience: the moment of realisation that follows is known as *détournement,* a term which originated with the Situationists. This term indicates a turnaround, or derailment, of an accepted notion. The practice of culture jamming most often occurs when artists/activists direct a moral attack upon consumerism and consumption in western societies, such as Reverend Billy on Disney or Jonah Peretti's attack on Nike.[412]

Since 2010 an interesting phenomenon has evolved within the school of art: a number of artist-activists are creating culture-jams of art schools and other higher education institutions. Mimicking the formal structures of higher education – semesters, assessments, modular study – this new take on a culture jam is a signifier of an underlying dissatisfaction with the current higher education system, particularly in the arts. Bearing in mind that a culture jam is an act of subversion, this phenomenon marks a reaction to both the value system, and the financial state, of current higher education.

[412] Reverend Billy stages attacks on well-known brands while using the persona of a traditional preacher, including crucifying Mickey Mouse in order to raise awareness of Disney's use of child labour. Peretti used the Nike customisation service to request that the word 'sweatshop' was embroidered on his trainers – the resulting email exchange went viral.

Examples include student-led projects which proclaim to be additional departments within the school of art but operating outside of its curriculum, such as Department 21 at the Royal College of Art, described by its members as a 'peer-led pedagogical experiment.[413] In addition, examples of free and alternative 'Universities' have been appearing in cities across the UK. There is a cluster of educational culture-jamming activity taking place in Liverpool. A group of interrelated cultural organisations and initiatives are exploring alternatives to art school education, while replicating some key concepts and practices from established institutions.

These organisations include *Disrupt Dominant Frequencies,* an established partnership that formed when two young artists opted out of the masters application process and created their own art school experience, The Free University of Liverpool (who have started offering a BA degree in Cultural Praxis) and The Institute for the Art and Practice of Dissent at Home, a family direct action initiative created by a married couple who each have a PhD in art practice. The actors in these groups have largely already successfully navigated the higher education system (and some continue to work within it), and the creation of these organisations stem from activism, from a desire to critique, and to create an alternative to, a system which they deem unsatisfactory. In their 2008 article, Jennifer A. Sandlin and Jennifer L. Milam discussed culture jamming campaigns as a form of public pedagogy, arguing that the process of *détournement* demonstrates the fulfilment of a prompted education process, writing that:

[413] Department 21 has run since 2010 and has the support of the Royal College of Art. See http://www.department21.net for project information

‘As a site of critical public pedagogy, culture jamming highlights ordinary people working collectively for social change.[414]

As Sandlin and Milam note here, the philosophy of culture jamming is essentially the same as that of critical pedagogy. The article focused on examples that targeted consumerism and ethics and argues that educationalists should actively pursue culture jamming as an effective pedagogical tool. Dart noted this link four years earlier, commenting that:

‘Critical pedagogues have 'long called for an education that approaches everyday experiences; particularly in relation to popular 'culture, as sites for 'ideological struggle and resistance…’[415]

He later extends this argument in the context of the rich possibilities within visual culture of enacting critical pedagogy through culture jamming:

Thus, critical art educators are committed to the democratization of society through art education and schooling and seek to reach their emancipatory goals by creating awareness of, revealing, and 'resisting hidden forms of' power…’[416]

While the evolved concept of culture jamming and its roots in critical pedagogy have only emerged since the 1980s, the parallels with the Hornsey sit-in are striking. The students and staff involved continued to run the college and to offer a model of art education. They maintained the essential social hub of the college in the form of the café, even familiarising themselves with health and safety standards to avoid closure. They were diligent, focused and positive in their tasks but at the same time, they used pedagogy as a form of protest. This was a form of culture jamming, predating the origin of the term but operating in the same mode as more recent examples of culture jamming in pedagogy.

[414] Sandlin, J.A. & Milam, J. L. (2008) “ “Mixing Pop (Culture) and Politics”: Cultural Resistance, Culture Jamming, and Anti-Consumption Activism as Critical Public Pedagogy”.
[415] Darts. *Op. Cit.* (2004) p. 198
[416] *Ibid.* (2004) p. 316

Hornsey was remote from the city centre, a residential area, and as such it was not in itself a site for protest; nor did its residents expect revolution to happen on their doorsteps. The Hornsey protestors did try to gain solidarity and support from the wider community, sending out action groups to give out leaflets and answer questions outside local schools at home time, putting up posters, and publishing their documents through the willing press. They also, over the course of the sit-in, sent out convoys of students to visit other art colleges, to encourage similar action. There were similar but smaller-scale sit-ins at Guildford and Manchester. However, in the UK the political backdrop to the protest was entirely different and the situation in Paris – where students and workers eventually protested side-by-side on the city streets – would never be replicated here.

Despite the differences in international political conditions, the Hornsey sit-in used imagery and language suggestive of an oppressive regime which extended far beyond the perimeters of the school of art. However, their cause was pedagogy, not the broader issues of class, economy and state oppression which provoked the incendiary conditions across the globe that year. In the hands of the Hornsey students, the symbolism and language they used borrowed heavily from the language of the far bigger global protests. The Hornsey students contacted the Ecole des Beaux Arts in Paris, and received a letter back:

‘To the students of the Hornsey College of Art

The Beaux Arts is pleased to get in touch with you, following the events that have taken place at your college.

The Beaux Arts would like to stress that because the political situations in London and Paris are very different, this is simply a general picture of the way the educational system in French Art Colleges is being changed; the results may be compared directly with your own progress.’[417]

The Beaux Arts students then went on to outline a democratic committee they had put into place during their own ongoing sit-in, that would, if installed legally, contain an equal number of representatives from the student body, the teaching staff, and an equal number of elected outside representatives. This committee would vote on any decision made in the Beaux Arts. Although stating the difference in the political situations, this letter gives further evidence of the effort that the Hornsey students made to put their own actions in context, as well as demonstrating the link between their own outline for a management committee in line with the structure proposed by the Ecole de Beaux-Arts students.[418]

[417] AMHCA. (1968) *Letter from Beaux Arts.* June 1968

[418] AMHCA proposed an administrative structure which included Hornsey College of Art Association alongside – and equal to – the Board of Governors, the Academic Board, the Association Executive and the Representative Council. Hornsey college of Art Archive at the University of Middlesex contains a diagram from the sit-in outlining this.

ii) Performing Pedagogy

'The key point…was that the sit in was in itself seen to be a new form of learning experience and we said that explicitly to those who said, why aren't you working. A lot of the debate was about the conceptual structure of learning, especially the curriculum.[419]

Tim Jones

The sit-in saw students and staff gather together in greater numbers than ever before, as Figure 100 (overleaf) illustrates. It shows Buckminster Fuller speaking to a packed audience, arranged in a circle around the speaker to presumably overcome the traditional and hierarchical educational implications of rows of facing chairs. Students from other colleges, as well as 'rate-payers' from the district were invited to attend talks arranged during the sit-in as well.[420] Bearing in mind that before the protest, students were spread across ramshackle and poorly-maintained studios and seminar rooms across a number of sites, the experience of collective activity such as this must have been a heady one. This event is illustrative of an interesting issue in terms of the protest, as the inclusion of visiting speakers serves an educational function; throughout the protest the participants were 'performing' pedagogy.

[419] Sloan, C. L. (2006) *Email Exchange with Professor Tim Jones.* June 2006.
[420] *Op. Cit.* (1969) p.

Figure 100: *Buckminster Fuller speaking at Hornsey College of Art* (June 29, 1968)
Photograph © Steve Ehrlicher

Interestingly, in the first hour of Fuller's talk at Hornsey he covered, amongst a number of other topics the atom, the fall-out from wartime technology and education.[421] Fuller's own systems approach to architecture strongly reflected von Bertalanffy's General System Theory, a fact Fuller himself first realised when he met von Bertalanffy in the early 1960s.[422] Indeed, in 1972 Fuller was asked by a committee of French scientists to write a paper on von Bertalanffy for the Nobel Prize board – he did so, but unfortunately von Bertalanffy died before the nomination could be

[421] Tickner, L. (2008) p. 37.
[422] Krausse, J. et al. (2009) *New Views on R. Buckminster Fuller.* Stanford University Press. California. pp. 72-73

considered. This overlap of worlds and nations demonstrates the extent to which system theories infiltrated a wide spectrum of disciplines in the post-war years.

Fuller had worked in interdisciplinary college environments on many occasions over the previous twenty years, including his spell at the progressive Black Mountain College where he worked with Josef and Anni Albers. In this period, he undertook the mathematics which resulted in a full understanding of the architectural form the ‘geodesic dome’. Figure 101, below, shows a group of students working on building a dome.

Figure 101: *Students working on Buckminster Fuller's Geodesic Domes at Black Mountain College.* (1948-49) State Archives of North Carolina.

At this half-constructed stage it is possible to see that the underlying structure is a perfect network of nodes and connectors. The geodesic dome, once complete, is a self-supporting structure with an even distribution of stress. In Figure 102, below, students are absorbed by Fuller's explanations; behind them, the shelves are filled with paper models of complex polyhedra.

Figure 102: *Students working on Buckminster Fuller's Geodesic Domes at Black Mountain College.* (1948-49) State Archives of North Carolina.

Fuller believed in the power of design to transform societies, writing that:

'There is only one revolution tolerable to all men, all societies, all political systems: Revolution by design and invention.'[423]

This was the philosophy which formed the heart of the Hornsey Affair and which drew Fuller to speak. The protest was an exercise in reinvention; it was not simply an act of defiance. This can in part be read against the active involvement of a number of members of teaching staff. It is also interesting to compare the participatory and research-driven teaching practice that Fuller implemented at Black Mountain College against the somewhat stifling and unfulfilling curriculum described by the students

[423] Fuller, B. (1969) [1965] *Utopia or Vision: The Prospects of Humanity.* Bantam Books. New York.

and staff at Hornsey. There is an interesting link here between Fuller's participatory approach and his philosophical grounding in System Theories, one which has parallels with the network approach devised at Hornsey that year.

The activities at Hornsey generated a lot of interest and support within the art community, and there were many other visitors to the college during the sit-in. Professor Tim Jones recalls that:

'Much more radical art came to the surface during the sit-in. Stuart Brisley had been working on 'events' (aka performance art) for only a year at the time of the sit-in and some of the events he did were very influential, not only on me (I took part in many of his events in the late 60s and early 70s) but on a large number of those present – this was the real launch of performance art. The sit-in attracted many interesting people who contributed in various ways – John Latham was brought in by Stuart Brisley, Buckminster Fuller gave a long and fascinating talk, Jim Dine, Ron Kitaj and others staged a discussion, Cornelius Cardew did a big session with an impromptu scratch orchestra involving everyone present – and they contributed to the ethos of the place as a hotbed. By contrast, the college's former fashionability seemed hollow with the new level of energy.'[424]

Jones' suggestion that Hornsey witnessed the early development of performance art and that the sit-in saw Brisley enact some of his earliest performances highlights a vital and under-discussed aspect of the protest. The development of performance art ran parallel to the behaviourism of 1960s arts pedagogy in which students were often forced to 'perform' through exercises based on conscious manipulation at the hands of teaching staff. Many of the issues of post-war communications, surveillance and the tension of the Cold War explored in this thesis have provided a cultural and social context for behaviourism in the art school, but the other outcome of behaviourism was a growing self-consciousness; an awareness of the tense game played out between artist and audience. This is the basis for performance art. Just as many students took

[424]Sloan, C. L. 6th July 2006. *Jones, T. E: Responses to Questions by Email*.

part in Brisley's early performances, they also took park in the very public performance that was the protest itself.

To a large extent, the protest itself also mimicked its own subject; teaching structures within the school of art. In June, the AMHCA received a communication from the Institute of Contemporary Arts, inviting them to use their space to create an exhibition of some sort to promote and explore their cause. After some thought, the Hornsey association released a statement outlining their intentions for the exhibition. They described it as a graphic display and non-stop forum, and stated that the whole show had been conceived and executed as:

'…part of the same democratic process which has taken root at Hornsey.'[425]

Art students got in free. Figure 103, overleaf, shows the newspaper advert for the ICA show, which they have described as a 'look, talk and think-in'. It has a boldly geometric design, reminiscent also, of hard edge painting. Figure 103 on the following page, shows an exhibition at a Hornsey reunion event in 2005, organised by Jamie Wagg and Nicola Shilcock, which contained elements of the original ICA show.

---

[425] ASSHCA, Document 52, June 1968

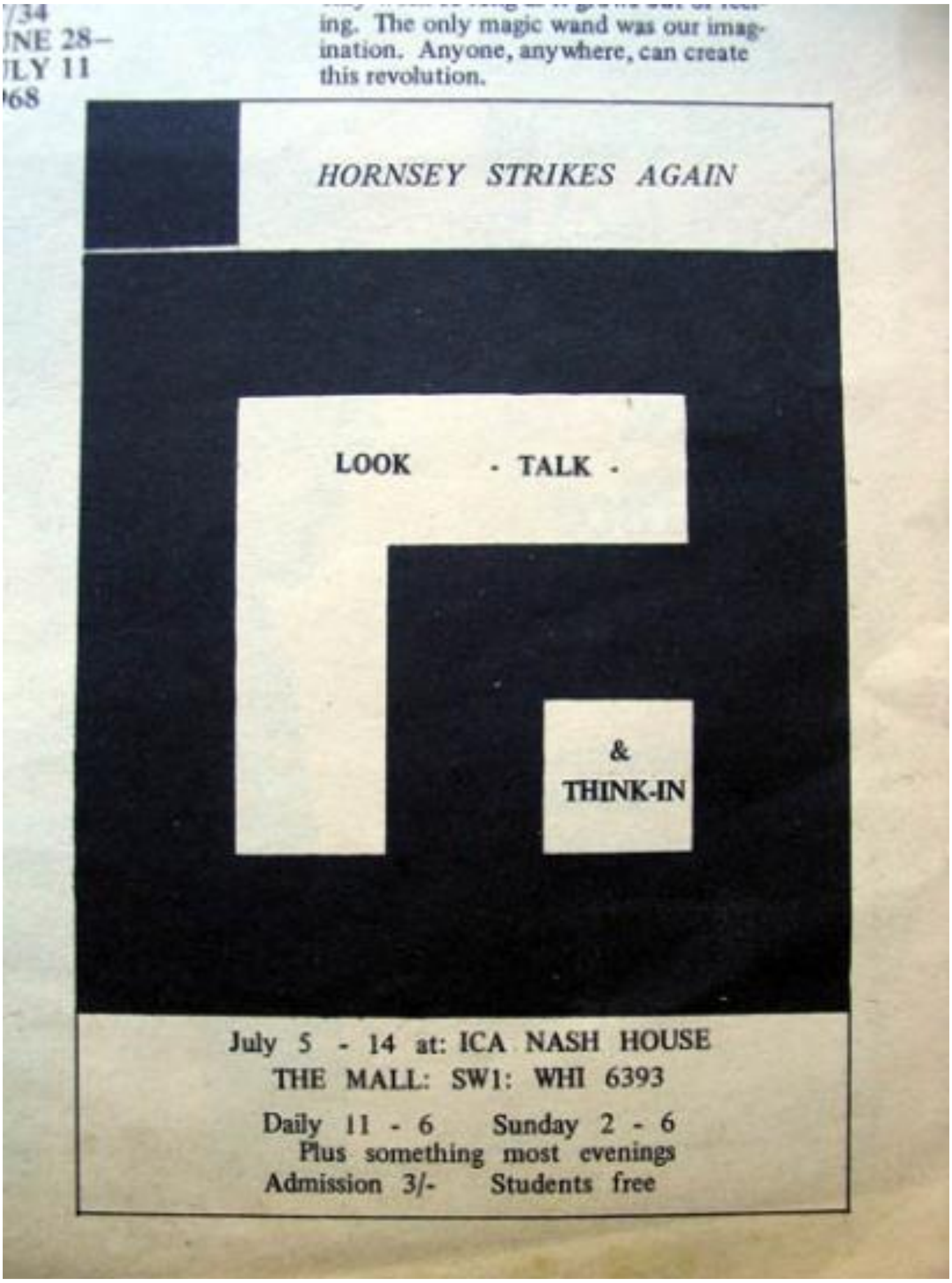


Figure 103: Anonymous. (June, 1968). *Press Advert for ICA Exhibition.*

Figure 104: Hornsey Project Exhibition. (28th May 2005) *Installation View.*

The ICA is described within ‘the Hornsey Affair’ as follows:

‘A huge Diploma in Art and Design in a gilt frame on a silver easel, surrounded by hundreds of flashing lights, beckoned the visitor into the first section – the ‘Dip.A.D Course’ – where a dark, narrow labyrinth of corridors provided the right oppressive atmosphere. It contained an interview room, wooden authority-Figures, a display of forms, and an art-history nightmare. When one pushed out of this, there was by contrast a large open area where information of all sorts could be obtained, and a miniature replica of the Hornsey student canteen where one could get a coffee and watch a continuous multi-screen projection about what had been going on in the college. After this was a debating room, where discussions were arranged in the evenings with outside speakers from the art and design fields.’[426]

Although the ICA show lacked subtlety, it was certainly an accurate symbolic representation of their position on art education. However, it is also interesting that

[426] AMHCA. (1969) *The Hornsey Affair*. Penguin Educational Specials. p. 171

discussion and the Association's democratic process led to an installation set up, considering installation had not been a dominating creative format before the sit-in. This may have simply occurred because the exhibition was designed through collaboration between designers, painters and sculptors, and it hence reflected the interests of each. It is also relevant that the group started by outlining what it was, precisely, that they wished to communicate, and then considered how to realise it. This is the process of conceptual art. It appears that installation and conceptual processes are a natural result when you remove departmental barriers, and place process after concept.

It was as if Hornsey became its own mythical PR projection – it was a hub of activity where new ideas were discussed and explored day and night, where students and staff worked together to the same end of creative exploration and discovery. Successful artists, designers and musicians joined in the proceedings. And here, perhaps, is what Hornsey, and the DipAD had needed all along – greater connection with the art community for whose purpose it existed and to whom it belonged. This brief-lived period of joyous experimentation ended in July, and when the staff and students returned to Hornsey in September they found the door locked. All staff who had participated were sacked, and all students who had participated were excluded. Other institutions sympathetic to their plight offered the students places and employed what staff they could, and eventually all the staff moved on to other posts, despite their involvement. David Page experienced a brief moment of fame:

‘Students plastered the roof of the tunnels at Finsbury Park tube with stickers which said ‘David Page sacked’ and they cropped up all the way to the mall – I remember a couple stuck to the steel columns of New Zealand House.[427]

The doors of Hornsey College of Art remained locked for six weeks, the same length as the sit-in, and when they reopened, there were bars at the window and barbed wire around the walls. The college was safeguarded again revolution – for a while. Jones reflected that:

‘The effect on me was profound and set me on the path of educational experiment to which I have been committed since then….I am currently dean of one of Europe’s smallest and most radical art schools. I doubt I would have gone that way but for Hornsey. At the time Hornsey was of immense significance, but now it is largely forgotten.’[428]

---

[427] Sloan, C. L. (2006) *Email Exchange with David Page*. 27th July 2006
[428]Sloan, C. L. (1968) *Email Exchange with Professor T. E. Jones.* 6th July 2006

3.4) The Network System: Structured Pedagogy and Liberal Education

i) From Linear Systems to Networks

Against the backdrop of upheaval, the student body and a handful of teaching staff members set about proposing an alternative, liberal model for the DipAD. Their point of departure was describing the current system and highlighting what they considered to be its deficiencies. Given the art school context, it is unsurprising that they did this visually, in a diagrammatic form. AMHCA described the existing curriculum as a 'Linear System' (Figure 104, below), meaning a direct progression through a conceptually and materially defined course with little room to experiment with interdisciplinary practice and no option to change specialism completely. The problem with the linear system was, in their eyes, its rigidity: there was no room for exploration of other disciplines and ideas, due to this early specialisation:

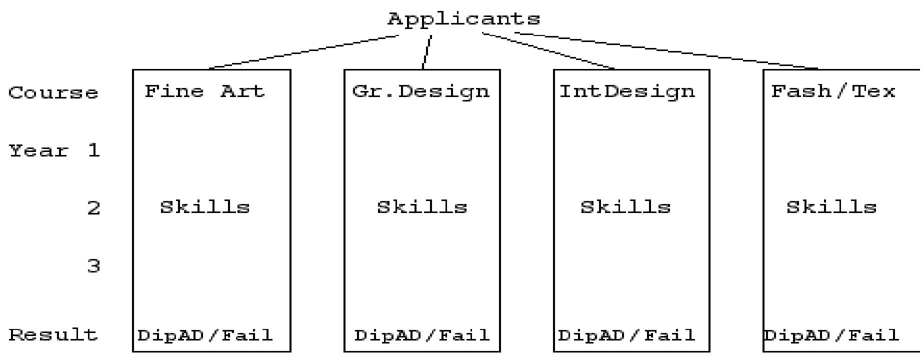


Figure 105: AMHCA. (1968) Linear Structure of *DipAD*.

The diagram itself was a simple visual summary of the closed routes of the DipAD, created in order to form a comparison with the other models proposed during the sit-in. It illustrated the distinct boundaries which the DipAD created between subjects, with limited opportunity for interaction or interdisciplinarity. Given the historic treatment of design subjects as a secondary outcome of art training, this subject equality is interesting. The new DipAD moved on from the old model for the arts and design, offering instead focused areas of study in a choice of parallel - and distinctly separate - disciplines. Given the manufacturing boom which took place in the post-war years, it is no surprise that the new DipAD repositioned the design subjects to reflect their increasing importance socially, economically and culturally.

The intense debate about pedagogical structure which took place during the sit-in was reflected in the development, by those involved, of an alternative structure for the DipAD. In fact, developing and releasing this alternative model was one of the first tasks undertaken by the staff and students, creating the framework for a system of education which they proposed would suit the needs of the student body better. On the subject of the engagement with curricula during the sit-in, Lisa Tickner wrote:

> 'Perhaps surprisingly, among a plethora of documents there is none that maps in detail a sample curriculum. What the sit-in was obsessed with was structure, rather than content, and the sit-in advanced the idea of a 'network system' to maintain optimum flexibility.'[429]

While it is true that the AMHCA did not offer fully realised courses and classes, what they did produce was something more interesting. Tickner's statement obscures both the peculiarities and strengths of the experimental pedagogical models produced during the sit-in; within the first week of the sit-in a statement was issued by AMHCA, mapping out their suggestions for an appropriate educational system. They labelled this the 'Network System' - the concept of a 'network system' was an interesting reflection of changing approaches to organisational structure in the period. Underlying

[429] *Op. Cit.* (2008) p. 50

the particulars of classes, courses and assessment is a structure. This structure consists of connections and boundaries; it is essentially a network, creating and defining departments and courses, forging connections between them. The structure is more important – it controls and limits the teaching methods and approaches within the system. This means that the *structure* of pedagogy is politicised as it controls possibility. Moreover, it is so well-concealed behind the performance of education – the classes, workshops and examinations – that it is essentially invisible, or hidden.

Many of the issues around the new DipAD curriculum arose from the class implications that arose from the introduction of required grades and new academic content. It is interesting that this political agenda was not well-received by the wider public; perceptions of the Hornsey Affair were often less than charitable and at times aggressive. An anonymous postcard sent to the students during the sit-in nicely captures this:

'To the stupid students
Why do not you two-a-penny, feather-bedded students get back to your hovels from whence you were pupped. We workers do not pay out huge sums from our pay to school useless spivs and drones. Clear out! And make way for decent Citizens.'[430]

This picture of the students as indulged, coddled by state subsidy, lazy and misbehaving masked the issues which prompted the protest. This was despite the traditionally working-class and local student body at the college. As noted previously, a decade later the political content of the sit-in was treated in plainly dismissive terms by Dave Rushton and Paul Wood.

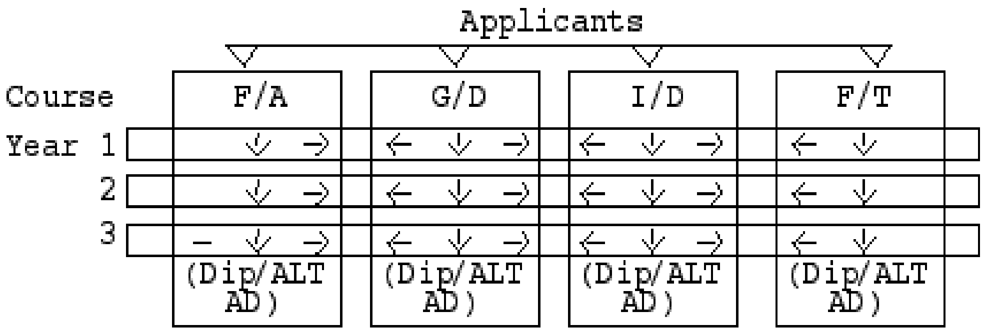
[430] J.H. et al. (1969) *The Hornsey Affair.* Penguin Educational Specials. London.

In their ‘Proposal for an Alternative System of Education’, AMHCA wrote of the existing system that:

‘This system by virtue of its structure inevitably means the student is completely dictated to by the course in his attitude to his work, career and future. His decided course is binding and his decision to enter his specialised field is made by largely ill-informed and inexperienced judgments. All this system proposes is that if he meets the requirements of the course over which he has no say he receives a diploma - nothing more.

We propose the introduction of the following alternative. This system is referred to as the "NETWORK" set-up’[431]

The creation of a network system represented an effort towards democratising values by the students and staff involved. It is important to establish that this terminology was unusual for its time – ‘network’ had not yet become a common term in terms of computing, although it had been applied to radio for some time. Its etymological root applied to fishing nets, the *working* of knots creating a *net*, a structure of connections. It was variously applied to structured systems in biological, technological and social forms from the mid-nineteenth century. However, the visual structures used by the AMHCA to express their pedagogical models have clear parallels with electrical circuits, a series of points connected by grids and lines:



[431] AMHCA. (1968) *Proposal for an Alternative System of Education.* Hornsey College of Art Archive, Middlesex University.

Figure 106: AMHCA. (1968) *The Network Set-Up.*

In their development of a network structure, the designs produced have a clear visual relationship to the cybernetic forms of abstraction and conceptual practice which had evolved in the 1960s at Ealing and Ipswich, as reviewed in the Groundcourse case study of this thesis. While the underlying concept of educational freedom is relatively simple, the visual language of this diagram and others needs further scrutiny in light of the suggestibility of both network language and imagery. Figure 105, above, shows the earlier of two network models produced. In this version, the disciplines of fine art, graphic design, Industrial Design and fashion and textiles are indicated, with arrows marking the progression through the years and between subject areas if desired. Their proposed 'network system' allowed freer movement between disciplines, from first year right through to the final year.

They also wanted entry requirements eliminated, no distinctions between vocational and diploma courses, and the ongoing freedom to formulate, develop and explore their own educational system. This was promptly followed by a proposal focusing on changes to secondary education to fit in with this new concept. The gaps on the grid of the network design might imply connectedness, but they also imply separation. The departments in the network system would each have their own finite activities, despite movement of students between them.

The structure of the network was grid-like – simple for the sake of explication of their requirements, but lacking the complexity that a true network would exhibit. It gave all subjects equal weight and spaced them at equal intervals - it was very much a system of equality. It is clear on consideration, however, that for a grid structure to operate successfully, all nodes on the network must remain equal, and all distances between them must remain equal. This was eventually reduced to the following diagram by AMHCA:

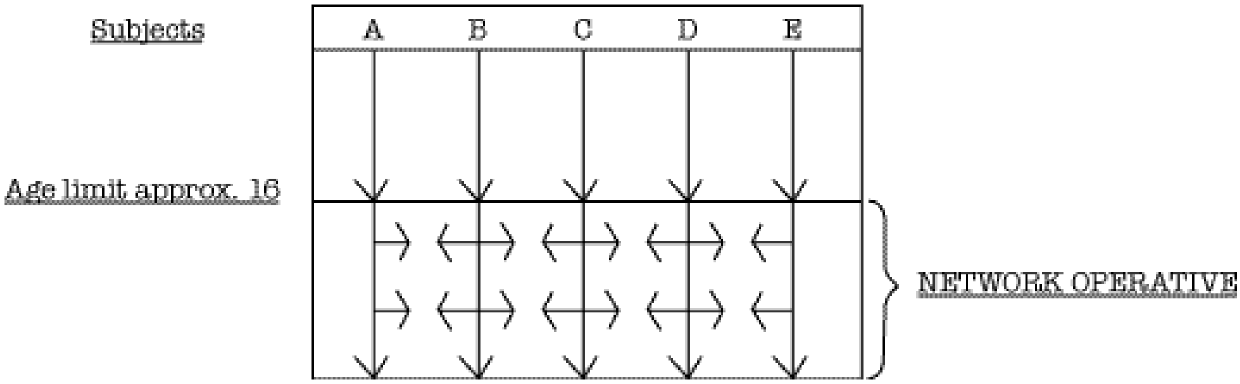


Figure 107: AMHCA. (1968) *The Network Structure*.

This diagram is reduced to a series of connections, a flow. In a network, information, people or ideas must be able to move from one node to another, allowing information and ideas to filter through the system and inform the whole. I interviewed Tim Jones, now Dean of the Burrell College of Art, who was one of the eight original members of the student action committee. In response to my questions on how the students went about designing their new education system, he recalled that:

'The idea of the 'network structure' was evolved at Hornsey – something that dissatisfaction with and reaction to the training model of learning that was widely presented to us in the mid-60s and in part from a loose interpretation of American education.'[432]

[432] Sloan, C. L. *Interview with Tim Jones: Responses to Questions by Email*, 6th July 2006

Jones highlighted the fact that the network model for pedagogy, although simplistic to the modern eye, was unusual for its time and certainly unique in the context of British higher art education. David Page stated that:

‘The network structure was largely, though not exclusively, the concern of the DJMiniPipers (i.e. students of David Warren Piper, a psychologist who worked with Industrial Design). They were engineers at heart…and looked for structures that would produce optimum results. Arguments about alternatives started from on the ground, but other systems were looked at (for instance the Hall-Dennis Report of the Province of Ontario).’[433]

There are two issues that need drawn out from this. The first is the implications of the Industrial Design student’s engineering approach to pedagogy and the second the ideological content of the Hall-Dennis Report. The Hall-Dennis report was published in 1968 by The Ontario Department of Education and headed by Justice E.M Hall and Lloyd A. Dennis. They argued that education should be about self-realisation, and that teachers should guide rather than dominate. They suggested project work, individual research, discussion and joint planning between student and teacher. Although the report focussed on school children, the issues were pertinent to the Hornsey students, who felt their education to be too restrictive, and the teaching too dictatorial. In setting out their agenda, Hall and Dennis wrote:

‘Democracy implies the freedom to think, to dissent, and to bring about change in a lawful manner in the interest of all. It is a flexible, responsive form of government, difficult to describe in fixed terms. Democracy does not arise as a result of imposed or structured political practices, but as a dynamic, liberating force, nurtured by the people themselves. It can thrive and flourish only when its citizens are free to search continually for new ideas, models, and theories to replace outmoded knowledge in an effort to serve an ever-increasing populace tomorrow.’[434]

---

[433] *Op. Cit.* (2006)

[434] Hall, E.M. & Dennis, L.A. (1968) *Living and Learning*: *The Report of the Provincial Committee on Aims and Objectives of Education in the Schools of Ontario (The Hall-Dennis Report)* Ontario Department of Education. Toronto. Accessed online 22/02/2013 at: http://www.connexions.org/CxLibrary/Docs/CX5636-HallDennis.htm

This statement was part of an introductory chapter entitled "The Truth Shall Make you Free", which offered a vision for the education of young people grounded in a thoroughly liberal ideology, something that would need a pedagogical structure focused on the needs of the individual. They continued:

> 'To ensure its continuity, a free society must develop and promote opportunities for science, philosophy, the humanities, and the fine arts to flourish side by side, strengthening and complementing each other in the search for truth. All aspects of learning must be given support, for great ideas are not the exclusive property of an intellectual elite. They can permeate the atmosphere of a free society, and can be grasped and acted upon by great numbers of people.'[435]

Given that the academicisation of art and the class division created by the academic/vocational split was an incendiary issue at Hornsey, it is plain to see why the Hall-Dennis Report would have offered a model for embedding egalitarian values into pedagogical structure. The Hall-Dennis report is typical of the idealism of educational literature of the 1960s, when the belief that education should equip the individual for life, not simply for a defined vocation. There was an emerging interest in transferable skills, both in terms of vocational skills and life skills. It was the decade of progressivism, with a focus on the needs and interests of the learner, free interplay of ideas, personal and communal growth, education as living not as preparation for living. This is what the Hornsey sit-in participants were advocating, over the essentialist system of prescribed subject matter and teacher-control within which they were currently teaching and being taught.

The impact of the Hall-Dennis Report is evident in Document 10, written on the 2nd of June 1968, the Student Action Committee stated that:

[435] *Ibid.* (1968)

'…the system now in existence requires that for entry into further education, the candidate holds academic qualifications assessed purely by written examination. At present this form of assessment is not conducive to showing the full creative potential of the candidate, due to their purely academic demands. Furthermore, by nature of the courses which are directed towards the present GCE structure creative ability is not encouraged and therefore liable to atrophy. Therefore, the GCE should be replaced by an assessment of work done up to the time of the review.'[436]

The idea that a new structure for creative education was needed at school level - as well as the problems of undoing educational inequalities which were already established by the time students left compulsory education in line with the underpinning philosophy of the Hall-Dennis Report. They continued:

'We demand that the onus for the promulgation of creative thought should be placed upon Grammar, comprehensive and secondary modern schools and not left until the further education (tertiary) stage'[437]

The disjuncture between school-level art and design and the art school experience had been the basis for the development of foundation courses, as discussed earlier in this thesis. Initially designed as a kind of grammar of abstraction for the training artist, over the course of the 1960s these 'pre-diploma' courses had been formalised by the Coldstream report became increasingly experimental and varied due to lack of formal guidelines. This was also representative of the swift conceptualisation of contemporary art; the short-lived idea of a grammar of abstract visual language passed, leaving uncertainty as to what would characterise a proper foundation for higher art and design studies.

ii) Product Design: Engineering the Curriculum

[436] Hornsey Student Action Committee. 2nd June 1968. *Document 10.* The Hornsey College of Art Archive, the University of Middlesex.
[437] *Ibid.* (1968)

The second issue of pedagogical design at the hands of the students to whom David Page referred as ‘the DJMiniPipers’ is interesting, particularly in light of Rushton and Wood’s direct criticism of David Warren Piper’s own pedagogy as pandering to the needs of commercially-driven industry a decade later.[438] Piper, pictured speaking at the sit-in in Figure 108 (overleaf), was the source of the engineering mentality which was prevalent in the Industrial Design department:

Figure 108: *David Warren Piper (speaking) and Alex Roberts during a sit-in meeting at Hornsey College of Art.* (1968) Photograph © John Rae.

[438] *Op. Cit.* (1979)

This mentality was manifested in the context of the sit-in in an abstract way. The brand of pedagogical design at Hornsey certainly has facets of social engineering, even if the desired outcomes were liberal; pedagogy by nature structures and controls the student experience. Their object during the early stage of the protest was to offer a curriculum model that would overcome the issues created by the DipAD. One of the Hornsey documents records some of Warren-Piper's reflections on the network during the sit-in, confirming the link between his strain of design and the pedagogical network evolved in collaboration with staff and students.[439] In it, he reflects on how the network system would be managed by staff, reflecting on the need for two interacting layers, or structures, of technical ability and design ability:

'The first structure would be determined by technology. Staff would be organised into units concerned with the operation of particular kinds of plant, the manipulation of certain materials, or the exercise of certain craft skills. This structure would provide a service in terms of facilities, and short courses on specific skills or techniques.

The second structure would be determined by the variety of educational "treatment" to be provided for students. In this structure the staff are responsible for students and their progress through the system. This structure would also be responsible for nurturing the learning of those aspects of the education not specifically related to a technology, a material or a craft.'[440]

Piper goes on to explore how a system, in which the specifics of materials or concept were not defined, might be managed or taught. He outlines a process of negotiation and discussion between teacher and student in which goals are set in relation to a wider area of study. Piper was essentially noting down ideas of a teaching practice which would not disrupt the freely networked and libertarian model they were proposing at Hornsey.

---

[439] AMHCA. (1968) *Document 55: Study paper: Quick Thoughts on the Network. D.J. Warren Piper* Hornsey College of Art Archive, Middlesex University.
[440] *Ibid.* 1968.

The term ‘network’ was unusual in its utilisation by the ‘DJMiniPipers’ and it is an indicator of the absorption of the language of technology into culture. The cybernetics texts of the era used the word ‘system’ rather than ‘network’; but the Hornsey affair took place only shortly before the new age for digital computing brought ‘network’ into common parlance with reference to both technology and society.

iii) Light-Sound Workshop at Hornsey

An interesting teaching and practice experiment that treated art as a more networked experience took place at Hornsey in the years 1965-68, in the form of a project called the Light-Sound Workshop. It involved John Bowstead, Dennis Crompton, Peter Cook, Roger Jeffs, Tony Rickaby, Martin Salisbury, Dante Leonelli and Ron Sutherland. The group worked, often collaboratively, on a number of projects and exhibitions involving light projections, film, animation, tape-slide programmes and sound. These included *Miss Misty and the Tri-Cool Data,* Aston University, Birmingham, 1965, *Ultra-Stellar Scanner*, Brighton Festival, 1967, *Light/Sound Workshop,* Oxford Museum of Modern Art, 1968 and *Time for a Change,* Young Contemporaries, ICA, London, 1968.

Dante Leonelli was perhaps one of the less commercially motivated members of the department: he founded a ‘Department X’ which focused on light and sound. Leonelli’s Department X drew great interest amongst the students, as did Stuart Brisley’s early experiments in performance. Both artists had a debt of sorts to Minimalism, in terms of methodology and in terms of philosophy. Leonelli saw light as a material to be manipulated, renouncing traditional artistic skills in favour of this.

Figure 109, overleaf, shows the installation at the ICA in 1968. Most famous because of the musical involvement from Pink Floyd, the LSW, run by the Advanced Studies Group at Hornsey, presents a different and more experimental side to the college, important given the perception of the college as a stifling environment in which experimentation and interdisciplinarity were blocked.

Figure 109: *Time for a Change.* LSW. ICA, London. (1968) Photo credit: Tony Rickaby

The installation consisted of 12 carousel projectors, projecting a series of slide programmes onto screens which were hanging in a space through which people could walk. The pamphlet from the exhibition gave the following information:

> ‘In just 5 seconds switches 12 changes,
> implies a change in role for the artist,
> invites 18 screen involvement from the spectator,
> with wrap-round sound and phased feedback.
> Provides image selection from a rank of 972 stored units,
> displays up to 500 images in programmed series,
> gives an infinitely variable program potential,
> considers an instant happening world with an all round look.’[441]

Conceived as a total environment for the viewer, within which infinite combinations of the programmed series could occur, the LSW project demonstrates that several members of staff at Hornsey were interested in the questions provoked by the post-war cybernetic environment and its implications for visual arts practice. Burnham’s exploration of systemic trends in the visual arts with regards to minimalism has echoes here – the use of light, the focus on the viewer’s physical presence in the space, the introduction of temporal elements through technology. In his 2004 essay *Recoding Information, Knowledge, and Technology,* Michael Corris described the application of systems thinking to arts practice, stating that it:

“…was not destined to remain the exclusive property of a technologically minded elite of engineers, scientists, and mathematicians. In the hands of intellectuals, artists, and political activists, it would become an essential ideological component of the ‘cultural revolution.’”[442]

Corris outlined the power of systems thinking when applied outside the sciences. Systems theories were liberal because they echoed the interconnected analysis of systems biology, in which organism and environment were treated holistically. When this is applied in social and cultural contexts, the conventional hierarchical model of

---

[441] ICA. (1968) *Young Contemporaries.* Institute of Contemporary Art. London.
[442] Corris, M. (2004) “Recoding information, Knowledge, and Technology”. In *Conceptual Art: Theory, Myth, and Practice.* Cambridge University Press. Cambridge. Pp. 187-199. P. 189

education as imparted from teacher to pupil is rendered meaningless. Both teacher and pupil become part of a network of connected factors and influences which make up any given process.

iv) The Hornsey Network and Agency

With this point in mind, we can return to the sit-in, where the LSW was a measure of how far communication technologies had infiltrated the college. When AMHCA designed their network system for pedagogy, they intended to give a 'cultural revolution' form. The ideological shift towards students having far greater agency in their own education must be read against the quasi-Pavlovian trends in arts pedagogy which had evolved in that period, as well as the Gestalt 'programming' principles of visual perception which had predated them. Both of these approaches were listed in the Hall-Dennis Report as the two most dominant educational principles of recent years:

- 'Those approaching learning as observers of behavior, in the traditional Behavioristic, Stimulus-Response, or modified Pavlovian conditioning tradition; and
- Those approaching learning from the learner's point of view, giving emphasis to the holistic, Gestalt, perceptual activity of the mind, and particularly recognizing that the total response of the child to a barrage of stimuli is more than the mathematical reactive sum of its parts.'[443]

This is a problematic binary in the context of the post-war art school, because the application of Gestalt organising principles did not result in a focus on the learner. The so-called 'stimuli' were decided upon and controlled by teaching staff, an issue explored within this thesis in the context of Basic Design pedagogy. In fact, in visual

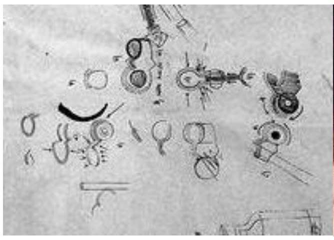
[443] Hall & Dennis. *Op. Cit.* (1968)

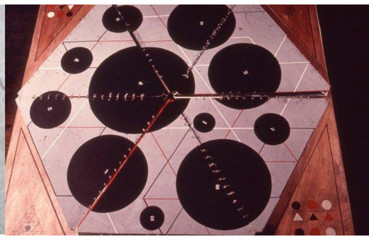
art education, Gestalt was also a kind of programming approach whether it came to controlling the viewer's visual decoding of images, or controlling the student's material and conceptual choices. It is, however, important to note not only the psychological underpinning for educational theory in the period, but also, vitally, that the origin of these theories was the technologies of war.

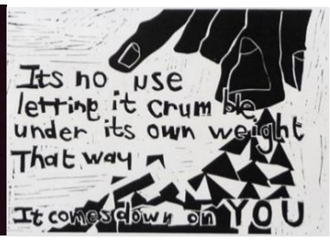
As noted then, Corris's statement that systems theories would become an' essential ideological component of the 'cultural revolution'' is in part validated by the Hornsey pedagogy, which drew in systems approaches in order to create a liberal system to replace the limited and uninspiring system already in place. It is worth reflecting upon the issue of proximity here; perhaps if the college had not been spread over scattered buildings of questionable suitability then there would have been more cohesiveness and far better communication between staff, students and departments. For the Hornsey network system to work in practice, greater physical proximity would have been necessary. Networked interdisciplinary practice is somewhat limited if one has to catch a bus between one department and another. Unfortunately the Advanced Studies Group was a casualty of the sit-in, when Clive Latimer, the director of the group, was fired for his part in the demonstration.

In doing so, the students and staff utilised a strongly systemic approach to art school teaching. As noted, the quality and resolution of the Hornsey network designs was not very advanced, but when these diagrams are placed in a proper cultural context they become more interesting. The pedagogical development in the art schools of the 1960s bore the imprint of wartime technologies and the psychological issues around 'thinking machines', as evidenced in the previous two case studies. The network system is thus not simply a product of the Hornsey Affair; it utilises the language of the age and it is connected with the broader trend towards systemic and network approaches which had been evolving in arts pedagogy for nearly twenty years.

4) Conclusion







In this study I set out to reassess post-war art school education in the wider context of systems in culture, taking in some of the most radical and influential pedagogical moments of the era. In doing so, I have drawn out the evolving place of technology as process, practice and symbol within the art school as a site of cultural production. Just as many questions have been formed as have been addressed, particularly with regards to the extent to which communication technologies and cybernetics infiltrated cultural production after World War II. In this period, they were not only explored in art schools as a subject matter, but also employed as a philosophy of education.

Each case study in this thesis has demonstrated a model of creative pedagogy which drew in systemic modes of practice. For the Basic Design movement, this included the grammar of abstraction, the primacy of mechanical and scientific form and the application of systems approaches to organic and human form. The origins of Basic Design at the Central School of Art under Johnstone need to be recovered, as the technology-driven teaching practices there created a rich breeding ground of ideas for young artist-teachers. However, while the movement originated in London, the majority of its innovations then took place in the North; a fact that in itself is worth highlighting due to the concentration of critical and historical attention applied to the

London schools of art. Richard Hamilton was a key influence in bringing systemic and mechanical influences into visual arts pedagogy in the post-war era and the fertile period of development at King's College, Durham was the starting point for a range of pedagogical approaches which drew in systemic and network qualities throughout the 1960s. Earlier in this study I reviewed the discussions which took place at the 1957 conference at Bretton Hall organised by a Society for Education through Art (SEA), entitled *Adolescent Expression in Art and Craft*, particularly the calls for an art education which took into account the science and technologies of the day.[444] Hamilton's pedagogies certainly approached this aim. However, Richard Yeomans noted that Hamilton's work was viewed as non-art, as simply exercises in design, basing this on recollections of an ex-student and Hamilton's to-be wife, the painter Rita Donagh. She recalled that 'Lawrence [Gowing] did not think of Richard as a painter...' and later, '...he thought it was design'.[445] That Lawrence Gowing, Professor of Fine Art at King's College, did not recognise Hamilton's work as such demonstrated a clear schism between Hamilton's evolving ideology and the existing teaching structures within art education at the time.

Yeomans comments on this, but this art/design categorisation needs interrogation, particularly in light of how an integration of technology and science might change the conventional subject boundaries and also, crucially, change creative values. It would appear that the problem of categorisation of Hamilton's Basic Design pedagogy arose from uncertainty as to what it 'did' – he pursued neither aestheticism nor meaning. He

[444] See p. 83
[445] See Yeomans, R. R. (1987) *The Foundation Course of Victor Pasmore and Richard Hamilton 1954-1966.* Doctoral thesis. Institute of Education, University of London. pp. 159-160

didn't work towards a design problem that needs a solution. His approach was reductive, limited and unified. The individualism of art and design was here abandoned for a collective 'experiment' in minimal form. There are many interesting counterpoints between design and art within the movement, particularly with regards to the early formative years at the Central School. Given this legacy, perhaps it is understandable that Basic Design might have been perceived as design – a grammar of shape, colour, line, which ran alongside the revived interest in typography and other such measured approaches at Central.[446]

The cultural backdrop to Basic Design was that of a society grappling with technologies which had changed the world as well as the larger problem of the place of the physical and biological sciences in technological development. In this new age of the machine, it was clear that technology had the power to imitate, harness and modify nature. While Hamilton's place in fostering the systems approaches within Basic Design was the most clearly defined, the same issues were apparent in the work of the other important figures, as well as the philosophical direction which pulled them all together.

Atomic warfare was the best measure of this uneasy technological state; the splitting of the smallest form of the known universe at the time and the subsequent apocalyptical interpretations of the damage that resulted. Just as advances in the biological sciences translated into interwar abstraction (morphology, growth, structure) so did the science

[446] Jesse Collins hired the typographer Anthony Froshaug, who made students work on typography using paper and sharpened pencils. See Seago, A. (1995) "Seise the Sans Serif". *Eye Magazine.* Vol. 16. No. 4.

and technology of the war (systems, analogue computing, cybernetics) influence the post-war generation. What occurred was a fusion of natural and mechanical form, a new molecular approach to point and structure and an analytical style of teaching which reflected the wider preoccupations of a society tentatively engaging with the new primacy of science.

Taking this further, Groundcourse was entirely conceived as a system, drawing in cybernetics, analogue computing and behavioural psychology. In both cases, the pedagogical model was one of staff control, in which the outcomes were designed and limited. Cybernetics is often treated as a philosophy of science - in fact it is also a term which accurately reflects the reality of the post-war technological world. As explored in this study, given the context of Aircraft Control, cybernetics becomes as concrete as it is theoretical. Furthermore, in cybernetic spaces, the concept of an analogue was vital to the layered physical/mechanical performance of an expanded environment which was taking place. There is a weighty quality to the analogue concept; a small plastic cube gains the significant threat of an approaching enemy. A map on a grid opens up the vastness of the ocean around the British Isles. The objects are carriers; in fact, they carry meaning in much the same way as the art object does, which is why it created such a rich dynamic within the Groundcourse Curriculum.

Overall, the combination of analogue, mechanism and environment within the context of the course created a mode of practice which was unusual in its conceptualism. It opened up questions of behaviour, action and interaction which became a mode of performance, while also introducing an unprecedented focus on interactivity to the college studio environment. Bearing in mind that participants were as young as sixteen and were not yet even studying at DipAD level, this conceptualism is all the more remarkable. There is much that could be drawn from the early incarnations of foundation courses such as Groundcourse, particularly given the broad and sometimes perfunctory nature of today's foundation courses. The key question is that of whether art students need this extra year of study and if they do, then surely a 'foundation' does not have to be as broad and bland as the concrete foundations for a building. Perhaps total immersion in experimental work such as this is a better foundation in terms of what it means to be a visual artist in contemporary times. To connect, to question, to navigate the complexities of self-knowledge within the broad matrix of creative practice.

It is clear that the relative freedom of the 'pre-diploma course' gave young artist-educators such as Ascott a chance to experiment with pedagogical form. However, there was distinctly little guidance as to how these foundation courses would be assessed and approved. Ascott reflected upon this in interview with me, recalling that students were given time to create proper portfolios at the end and resubmit them because the examiners felt they couldn't issue grades on the kind of work that had been submitted.[447] Former Groundcourse student John Bonehill is still confused by the structure and outcome of the course to this day:

[447] Sloan. *Op. Cit.* (2012) Interview with the author.

'…it was all a bit mysterious to me. My graphics college education was supposed to last 5 years…Anyway, the first 2 years were to be a Groundcourse followed by 3 more years of study. When I started in September 1962 up till 1964, I had no idea that this new 'curriculum', carried out at Ealing, would deprive me of the opportunity to graduate. It was the anger remembered that started my thoughts, or maybe it was something implanted in my psyche awakening after all these years. What right did they have to experiment on me?! The Board of education denied Ealing the permission to be merited with the 'Dip a dee doo da, da da' [DipAD], & it was too late for me to apply to other colleges, basically the whole lot of us were left on the shore. The 'Establishment' objected out of fear, no more Groundcourse at Ealing anymore.'[448]

Bonehill's confusion reflects that quite naturally, students assumed that a two-year 'pre-diploma' course would lead to a Diploma place. As the issue of validation for Groundcourse only came up at the end of their two-year foundation, it was too late to secure college places for that year. As I outlined earlier, an addendum to the first Coldstream report set out that a foundation year did not guarantee progression to the DipAD.[449] After the first two-year Groundcourse was complete, it was discontinued by Ealing due to these issues around validation and marking. Ascott immediately secured a post at Ipswich to teach the same model. However, after two years he was asked to leave for a somewhat strange reason - the college's application for DipAD recognition was rejected because if Ascott left, the college wouldn't be able to deliver. Ascott recalls this decision with amazement, as he was essentially fired for having vital skills.

In this exciting and radical period for art pedagogy, there was an evident conflict between the vital talent of new creative practitioners and the ways in which radical art exercises could be assessed. However, within Ascott's pedagogy and others of the period including Kardia's work at Central St Martins, the behaviourist focus also

448 John Bonehill. *Op Cit.* (2011) interview with the author by email.
449 Coldstream, W. (1965) *Addendum to First Coldstream Report.* NACAE

created problems on a fundamental level for creative practice. Behaviourism set limits; it treated students as subjects and works within defined perimeters. The DipAD courses themselves also had strict and defined perimeters, defining what disciplines students might study and eliminating the possibility of interdisciplinary work. In the changing political climate of the late 1960s, this finally caused a period of disruption in the form of the 1968 student uprisings at Hornsey, Reading and Winchester and across the world. In the following case study, one such disruption will be analysed, not simply as a protest, but as a form of performative pedagogy stimulated by the increasingly behaviourist focus of art teaching in the 1960s, including the experimental cybernetic approach Ascott had employed at Ealing and Ipswich.

In contrast, Hornsey was a reaction to the very issue of controlled pedagogy in the art school, as formalised by the DipAD. However, even in refuting controlled models of pedagogy in favour of a more liberal and democratic practice, the staff and students involved in the Hornsey protest utilised systems thinking to create their liberal 'network approach'.

Shortly after the Hornsey Affair the National Advisory Committee for Art Education was reconvened, and they prepared a second report which was released in 1970. This report recommended that colleges should be free to design their own course structures, and that these structures should give students freedom to move between disciplines. They retained Complementary Studies, stating that:

‘We see a prime objective of Complementary Studies as being able to enable the student to understand relationships between his own activities and the culture within which he lives as it has evolved’[450]

David Page reflects that most revolutions fail, and to many of those who participated, they felt that summer ended in failure – however, they did instigate some changes that had real effects on art school teaching in this country.[451] As noted, in 1973, Goldsmiths merged its sculpture and painting departments into one amorphous fine art department – and many other college courses followed suit. The academicisation of art qualifications continued, with many degree courses emerging along with the polytechnics, from the late seventies onwards. Most of these courses encouraged students to freely experiment with different media, and many of them were taught by the 1960s DipAD graduates. Interdisciplinary work has become the creative norm in art schools and in the contemporary art scene.

What is more interesting though, is the heritage of interdisciplinarity in the school of art; this being the efforts made by a generation of teaching staff and students who wanted an educational system which reflected the liberal politics of the era. The network system applied at Hornsey was simplistic but it had an ethos of systems utilisation at its heart. Bureaucratic power was depicted as a faceless and brutal monster, ruling through boxed-in systems which stifled the natural growth of creativity. The free movement between disciplines throughout a student’s course of

[450] NACAE, Joint Report of the National Advisory Committee on Art education and the National Council for Diplomas in Art and Design (Second Coldstream Report), 1970, p. 11
[451] Sloan, C. L. (2006) *Email Exchange with David Page.* June 2006.

studies was therefore held up as the most open system – and therefore the system most conducive to creativity.

This desire for agency must be read against the twenty years of art school pedagogy which preceded it, a period in which students had experienced experimental and often radical pedagogies but at the same time, their activities were dictated by the teaching staff who designed the courses. This period of British art education saw some genuinely exciting and collaborative moments in the schools of art, but there were definite facets of quite rigorous control and surveillance from staff, which dictated not only what the students worked on but also the range of possible outcomes which could result from each lesson or exercise. The self-consciousness of this style of studio training means that the whole environment and everyone within it become part of a performative, interactive mode of practice. The Hornsey Affair was a reaction to pedagogy of control, as formalised by the DipAD. At Hornsey, studio practice had stagnated somewhat, but the same top-down teaching ideology which had evolved around more experimental modes of teaching was applied here. To summarise, the 'Hornsey Affair' engaged with a set of entrenched values of control, structure and boundaries upon which the DipAD had been developed but which proved unsustainable a decade later.

It is clear then that the cybernetic era presented new issues for social and cultural control – systems and networks of communication and organisational function must be designed, and thus there is the potential to limit and define the role of individuals within any given system. While system theories had an instrumental role in developing useful, practical models of organisational management, when applied to the school of art they created debates around the extent to which the creative learning process should be limited – or liberated. In the immediate post-war years, a conventional teacher-to-class structure dominated pedagogy, with Basic Design pedagogues controlling student outcomes to give the students a unified introduction to the 'basic' language of art.

Groundcourse and other behaviourist trends in arts education blew this process open through the conscious and unapologetic performance of surveillance. At that moment, an interesting transition was made, in which both staff and students became part of an elaborate performance; part of a system of art production in which every individual had a role, including both the watchers and the watched. However, the one factor which skewed the power-balance in the system is that of design: the pedagogical structure was engineered by Ascott. Design is creation and it is control; Ascott controlled the design of the mechanical organism which was Groundcourse.

The liberalised network approaches devised at Hornsey overturned the downwards process of pedagogical design through a process of democratised involvement. As noted, while after the sit-in, this liberalism was quashed through various firings and expulsions, the central objects of concern for the Hornsey students were then stimulus enough for the commissioning of a second Coldstream Report. At this point, the recommendations made by Hornsey participants became the basis for a series of changes to national policy; a clear example of feedback between a system and its wider environment. In this way, beyond the power exchanges of creative pedagogy, the largest and most meaningful framework of power and influence for schools of art can also be summarised in cybernetic terms. In *Design for a Brain,* the book with such potency for Ascott, Ashby wrote:

> 'The organism affects the environment, and the environment affects the organism: such a system is said to have 'feedback'.'[452]

The systems approach to mechanism can be extended outwards to include any number of environmental or outside factors that have the power to affect its function. Arts pedagogy of the era clearly demonstrates the concept of feedback; the evocative use of technologies (and psychological approaches derived from technologies) to inform art teaching led to the wider cultural environment affecting the organism of the art school. In return, the application, exploration and subversion of technologies within art education 'fed back' into culture as this generation of artists left education and developed a more subjective, networked mode of practice than any other age.

After the second Coldstream Report of 1970, there was a vast restructure of art schools across the UK, with the majority of smaller schools merging with Polytechnics, including Hornsey.[453] The process of creating an academic qualification in fine art and design was thus complete, as the subject became one option amongst the many offered by higher education institutions. In the context of this study, the move towards merging art schools that took place in the period can also be read as part of the larger 'networking' agenda, drawing the arts into larger institutions. This process of absorption casts an interesting light upon the internal structuring of the subject of fine

[452] Ashby, R.W. (1960) *Design for a Brain.* Chapman and Hall (London) p. 37
[453] See Piper, D. W. (1973) *Readings in Art and Design Education 1: After Hornsey.* Davis-Poynter. London. And: Piper, D. W. (1973) *Readings in Art and Design Education 2: After Coldstream.* Davis-Poynter. London.

art after Hornsey. As noted, led by Goldsmiths in 1973, many art schools began to dissolve their conventional subject boundaries such as painting, printmaking and sculpture to offer instead a single 'Fine Art' qualification. To some extent there is a trajectory from the Basic Design concept of a shared grammar of art for artists and designers of all specialisms, but the removal of subject boundaries altogether reflected a networked interdisciplinarity, a desire to allow for cross-pollination – or feedback.

The changing identity of fine art during the period examined by this thesis of 1945 to 1970 has some interesting parallels with contemporaneous changes in technology. In his meditation upon this new age of technology, *The Ecstasy of Communication*, Jean Baudrillard describes the end of an object-led technological age. He used the example of the car earlier employed by Barthes as the 'supreme creation of the era'. Baudrillard writes:[454]

'No more fantasies of power, speed and appropriation linked to the object itself, but instead a tactic of possibilities linked to usage: mastery, control and command, an optimization of the play of possibilities offered by the car as vector and vehicle, and no longer as object of psychological sanctuary. The subject himself, suddenly transformed, becomes a computer at the wheel, not a drunken demiurge of power. The vehicle now becomes a kind of capsule, its dashboard the brain, the surrounding landscape unfolding like a televised screen (instead of a live-in projectile as it was before).'[455]

Whereas Barthes wrote of the car as a seamless marvel of modern perfection, its flawless bodywork worthy of aesthetic adulation, Baudrillard then identified a shift in both the power and the function of technology. The human subject became 'a computer at the wheel', no longer under the spell of a God-like surge of super-human power.

[454] Barthes, R. (1957) "The New Citroen". In: *Mythologies*. (1972) [1957]. Transl. Lavers, A. Paladin. London.
[455] Baudrillard, J. (1988) "The Ecstasy of Communication". In: Poster, M. (ed) 1988. *Jean Baudrillard: Selected Writings.* Stanford University Press. CA. p. 127

Instead, the driver was wired in, the car's function enacted by a union of man and machine. Baudrillard thus described the technological change that took place simultaneously with the advent of postmodernity in culture. Furthermore, the issues presented by the evolution of wartime technologies (radar, ground-mapping, digital computing) and the post-war cybernetic age were here described by Baudrillard on a more domestic scale. Using the example of the domestic car moved the change beyond that of warfare and into the realm of everyday social life.

The change in the cultural significance of technology as outlined by Baudrillard – from a desirable, controllable object to a computerised union of man and machine – has a parallel with the way in which the visual arts changed focus in the same period from detached object to networked experience. This parallel development is worthy of further interrogation, not just within the perimeters of the school of art, but also within other fields of cultural production. The prolificacy of systems approaches in science, technology and philosophy in the post-war years has resonances with the evolution of postmodern art that are as yet to be fully explored. They were touched upon here in terms of Hamilton's fused and holistic approach to designing the exhibition-as-experience, performative approaches to art-making and to pedagogy and interactive works of art during Groundcourse, as well as the systemic qualities of Hornsey's pedagogical designs.

Another important outcome of this study has been the emergence of a line of development in cybernetic art pre-dating existing scholarship which focuses on the late-1960s. As well as establishing a trajectory from wartime systems to post-war cybernetics in cultural production, I have also identified key examples of fully-conceived cybernetic approaches and ideologies within the context of art pedagogy from as early as 1960. Moreover, these examples involved some of the leading artists of the era, from Hamilton and Pasmore to Ascott and Kitaj. The late 1960s formed the end-point to this study and thus a review of the place of cybernetics in the visual arts by this time is a good place to end. In the year of the Hornsey sit-in, there was a clear presence of cybernetics in contemporary art. The poster below (Figure 110) was for *Cybernetic Serendipity*, an exhibition which took place at the ICA in August 2 – October 28 1968:

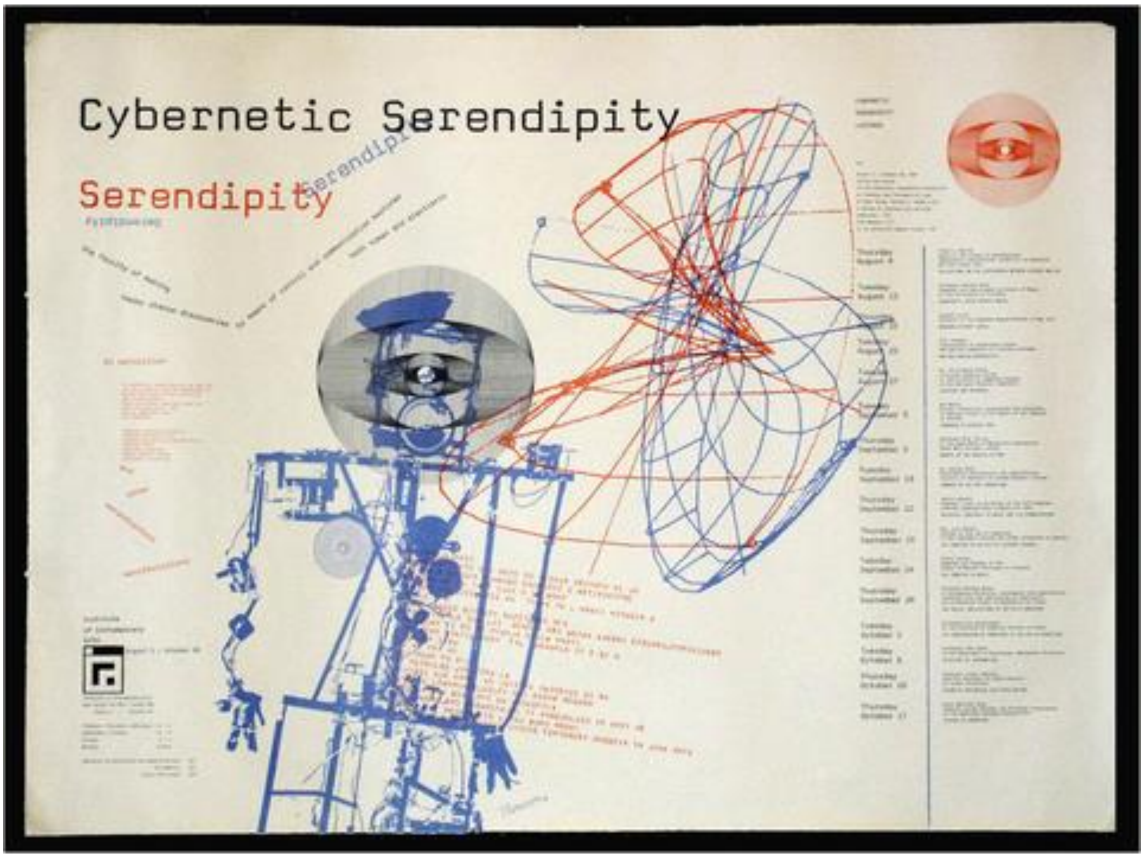


Figure 110: Poster for *Cybernetic Serendipity* Exhibition at the ICA, August 1968

This exhibition included a section dedicated to algorithms and devices for computer-generated music and film, computer arts projects, robotics, texts, computer graphics and kinetic objects and environments including Gregory Pask's collection of kinetic mobiles.[456] In the exhibition's press release, curator Jasia Reichardt wrote of cybernetics that:

'The term today refers to systems of communication and control in complex electronic devices like computers, which have very definite similarities with the processes of communication and control in the human nervous system. A cybernetic device responds to stimulus from outside and in turn affects external environment, like a thermostat which responds to the coldness of a room by switching on the heating and thereby altering the temperature. This process is called feedback.'[457]

The ICA exhibition was conceived in 1965, after Groundcourse had run for the first time at Ealing. Cybernetic theory was a vital facet of the contemporary arts of the period, and the research and development of the ICA exhibition is an indicator of its place at the heart of arts practice. Figure 111 (overleaf) shows visitors interacting with Peter Zinovieff's *Music Computer:*

[456] Reichardt, J. (1968) "Cybernetic Serendipity: The Computer and the Arts". *Studio International* (special issue) July, 1968. Studio International. London.
[457] Reichardt, J. (1968) *Press Release for Cybernetic Serendipity.* Viewed online 01/04/2013 at: http://cyberneticserendipity.net/

Figure 111: Peter Zinovieff. (1968) “Music Computer” *Cybernetic Serendipity Exhibition*. ICA.

The visual qualities of these early computers, with the nodes, lines, dials and switches, recall examples of student work from each case study in this thesis. In the context of the *look* of contemporary technologies, the rudimentary network systems created at Hornsey have more integrity. It is an example of the absorption of both the principles and aesthetics of contemporary technologies into pedagogy.

The ICA exhibition had far better fused the art/science content than Hamilton’s *On Growth and Form* from a decade before, where the link between the arts and biological systems of growth was principally aesthetic. However, the aesthetic qualities of *Cybernetic Serendipity* were somewhat reductive, since it was such a process-based exhibition. Cybernetic technologies were used to produce art, music and poetry:

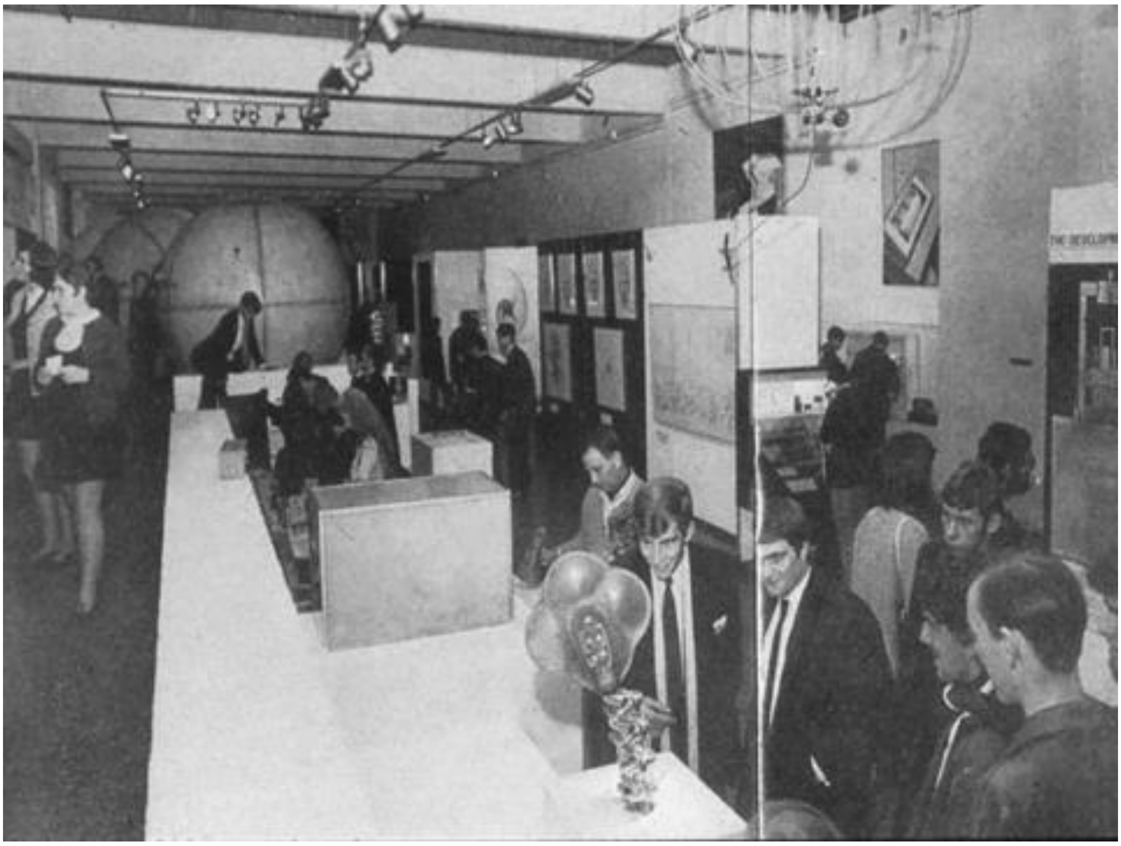


Figure 112: Anon. (1968) *Exhibition View of Cybernetic Serendipity* at the ICA

The installation view above shows crowd exploring the exhibition, which was a series of linked display areas and interactive stations. *The Studio International* special edition for the exhibition included a glossary of terms and concepts for the reader, indicating that many of the terms, including *feedback*, *interface*, *software* and *bionics* were not yet common parlance. These concepts contained rich possibilities for visual artists in the wake of abstraction. The same interests were developing simultaneously across the Atlantic too, as exemplified by the work of Jack Burnham in the same period.

Burnham's 1968 book *Beyond Modern Sculpture: the Effects of Science and Technology on the Sculpture of this Century* had been met with substantial criticism.[458] As noted by Luke Skrebowski in his article *All Systems Go: Recovering Jack Burnham's Systems Aesthetics:*

'Burnham's position in Beyond Modern Sculpture was technologically deterministic and self-avowedly teleological, anticipating that modern sculpture would 'eventually simulate living systems.' As such it read awkwardly. The work was heavily criticised by Krauss on its publication and presents a position that Burnham was to reject in his own later thinking.'[459]

However, the systems essays, articles and talks Burnham developed between 1968 and 1970 have retained their value and become the object of more rigorous critical assessment over the last two decades.[460] In *The Aesthetics of Intelligent Systems,* a paper delivered at the Guggenheim in 1969, he said:

'…it now seems almost inevitable that artists will turn toward information technology as a more direct means of aesthetic activity.'[461]

The paper explored the hesitancy visual artists felt when it came to engaging with machine technologies but proposed that the new communication technologies would change this. He discussed what he called the 'two-way communication loop' and commented that:

'As our involvement with electronic technology increases, however, the art experience may undergo a process of internalization where the constant two-way exchange of information becomes a normative goal. We should rightfully consider such a communication shift as an evolutionary step in aesthetic response.'[462]

---

[458] Burnham, J. (1968) *Beyond Modern Sculpture: the Effects of Science and Technology on the Sculpture of this Century*. G. Braziller. New York.
[459] Skrebowski, L. (2006) "All Systems Go: Recovering Jack Burnham's Systems Aesthetics". *Tate Papers.* Spring, 2006. Viewed online 03/03/2013 at: http://www.tate.org.uk/download/file/fid/7301
[460] See Skrebowski, L. (2006), Rampley, M. (2005) Shanken, E. A. (1999) Halsall, F. (2008)
[461] Burnham, J. (1970) "*The Aesthetics of Intelligent Systems*" in *On the Future of Art* (New York: Viking Press, 1970), pages 95-122.
[462] *Ibid.* p. 98

Burnham curated the 1970 exhibition *Software, Information Technology: Its New Meaning for Art* at the Jewish Museum, then one of the most experimental venues for contemporary art in New York. While the exhibition was disastrous, with malfunctioning computers, vast overspend and fighting gerbils in *Seek,* a controlled robotic environment created by Nicolas Negroponte and the Architectural Machine Group at MIT, the exhibition was conceptually innovative.[463] The architecture machine containing the gerbils (Figure 113, below) broke down, leaving the gerbils terrified under the broken mechanical 'grabber arm':

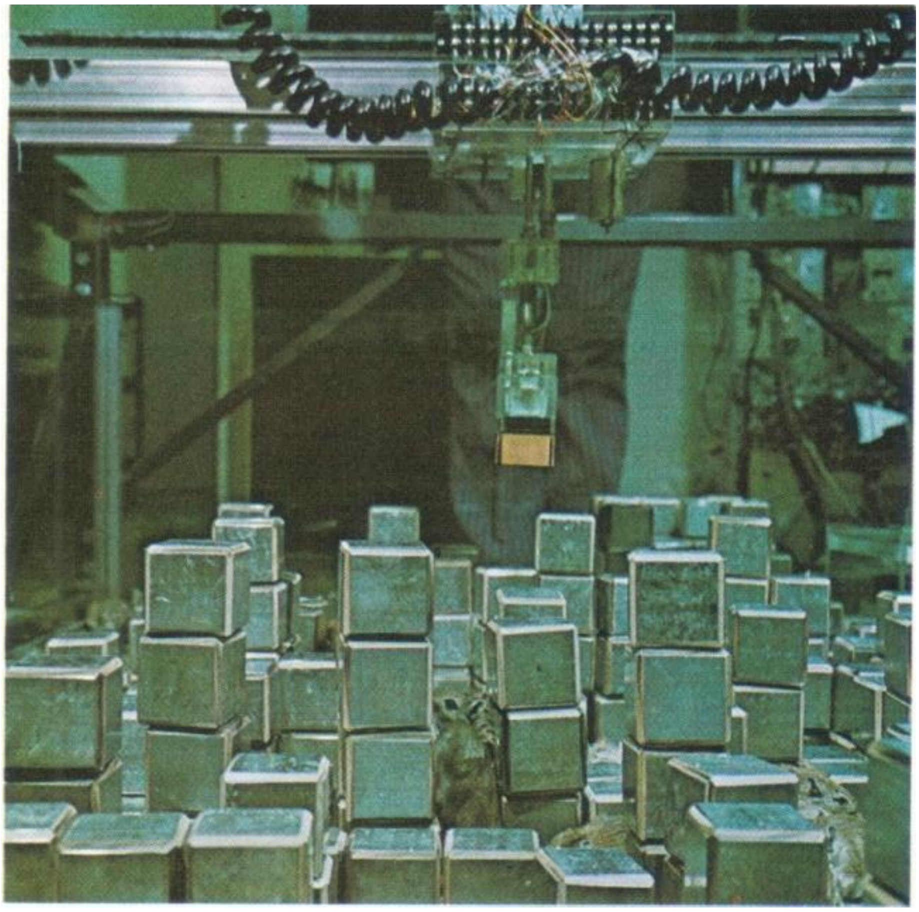


Figure 113: Nicolas Negroponte and the Architectural Machine Group, MIT. (1970) *Seek.* Software Exhibition. Jewish Museum. New York, 1970.

[463] For a discussion of this exhibition see Shanken, E. A. (1998) *The House that Jack Built: Jack Burnham's Concept of "Software" as a Metaphor for Art.* Leonardo Electronic Almanac 6:10 (November, 1998) viewed 01/03/2013 at: http://mitpress.mit.edu/e-journals/LEA/ARTICLES/jack.html

The computer was designed to maintain a planned environment of blocks as a kind of virtual city for the gerbils as they knocked over blocks, toppled towers and generally wreaked havoc. The computer could, with the aid of an electromagnet, align blocks and stack them, repairing damage. However, the computer broke down and the gerbils were left trapped and terrified. Thomas Hess described this in *Art News*, commenting that:

"Artists who become seriously engaged in technological processes might remember…what happened to four charming gerbils."[464]

The real question posed by *Seek* was that of what might happen when living things were introduced into a machine-controlled environment; a question that had enormous contemporary relevance as the cybernetic age advanced through the rapid developments taking place in computing. While on the surface this might appear Pavlovian, the gerbils were little more than lab rats. It was the behaviour of the machine that was the subject of scrutiny.

While the criticism levelled at the exhibition reflected the many problems and issues there were with it, at the same time Burnham's underlying concept was an interesting one – he wanted to create a context in which audiences could respond to, or participate in, programmatic situations created by artists. There was to be no division between art and non-art. In the year of the Hornsey affair, Burnham developed the concept of 'Systems Art', writing in *Artforum* that:

---

[464] Hess, T. (1970) "Gerbils ex Machina". *Art News.* (December, 1970) p. 23.

‘The priorities of the present age revolve around the problems of organisation. A systems viewpoint is focused on the creation of stable, on-going relationships between organic and nonorganic systems, be these neighborhoods, industrial complexes, farms, transportation systems, information centers, recreation centers, or any of the other matrices of human activity. All living situations must be treated in the context of a systems hierarchy of values. Intuitively many artists have already grasped these relatively recent distinctions, and if their "environments" are on the unsophisticated side, this will change with time and experience.’[465]

He used the practice of a number of minimalist artists to illustrate systems tendencies in the contemporary art scene, including Donald Judd, Frank Stella and Carl Andre. Burnham’s extraordinary contribution to systems thinking for the arts and culture drew in the issues of wartime technologies, the theoretical basis for systems theory offered by Ludwig von Bertalanffy and the shift towards objective communication approaches in the visual arts. It is important to note that he sat alongside Lawrence Alloway on the board for *Artforum*, which establishes a direct link between the parallel advances in art and cybernetics made in the UK and in the USA.

The technically sophisticated and high profile work included in *Cybernetic Serendipity* and *Software, Information Technology: Its New Meaning for Art* demonstrated that cybernetic art had become a fully-realised area of practice by the end of the 1960s. However, the pedagogical models that were reviewed here offered some of the earliest developments in systems and cybernetic approaches to art production, a fact that might have been overlooked due to the relative lower value attributed to art produced within the context of education. While the outcomes lack the technicality of the work reviewed above, what cybernetics in pedagogy did offer was an exploration of the power dynamics and issues of control that the cybernetic age engendered. I conclude then that given the collective nature of art training, pedagogy was the perfect level on

[465] Burnham, J. (1968) “Systems Esthetics”. *Artforum.* September, 1968. Viewed online 11/02/2013 at: http://www.arts.ucsb.edu/faculty/jevbratt/readings/burnham_se.html

which to explore systems of production, enacting the dynamics between individuals in this new networked age for culture.

Table of Illustrations

Figure 16: Maria Rasch. *Analytical Nature Drawing.* 1922. Rasch Archive.

Figure 17: Anon: Student of Richard Hamilton. *Analytical Drawing.* 1965. King's College, University of Durham. NAEA.

Figure 18: Creaney, S. Student of Richard Hamilton. *Analytical Drawing of a Change Ball.* 1964**.** King's College, University of Durham.

Figure 19: Anonymous. *Cutaway Drawing of Pullman Car*. In Sigfried Giedion. *Mechanization Takes Command.* 1948.

Figure 20: Dorothy Lee (student at the Central School). *Prototype dressing table in teak and 'Formica' plastic laminate.* 1960. Displayed at the Council of Industrial Design stand at the Furniture Exhibition. The Design Council/Manchester Metropolitan University

Figure 21: Tiffin. Student of E. A. Halliwell. *Painting of a Radiogram showing Front and Side Elevations*. c. 1960. NAEA.

Figure 22: Anonymous: Student of A. E. Halliwell. *Painting of a Radiogram showing Plans and Elevations*. c. 1960. National Arts Education Archive.

Figure 23: Richard Hamilton. *Structure*. 1950. Liftground etching and aquatint on paper. Slade School of art collection.

Figure 24: Anonymous. Installation View, *On Growth and Form.* 1951. ICA archive, Tate Gallery.

Figure 25: Richard Hamilton. *Publicity Material from the On Growth and Form exhibition.* 1951. Tate Gallery ICA Archive. Ref. TGA. 955/1/12/26

Figure 26: Anonymous: Student of Tom Hudson. *Analysis of structure in Apparent Informality: A Crumpled Paint-Tube*. 1965. Leeds College of Art. NAEA

Figure 27: Watterson A (student of Tom Hudson). *Colour Analysis of a Flower.* 1960. Leeds College of Art. NAEA

Figure 28: Anonymous: student of Tom Hudson. *Analytical Drawings using Charcoal and Ink.* 1960. Leeds College of Art. NAEA.

Figure 29: Victor Pasmore. *Preparation for the Waterfall Mural.* The Festival of Britain. 1951. Telegraph Newspaper archive.

Figure 30: Richard Hamilton. *Chromatic Spiral.* 1950. 543mm x 485mm. Tate Collection.

Figure 31: Anonymous. *A Postulated Interior of the Duck of Vaucanson.* 1738.

Figure 47: Anonymous: Student of Richard Hamilton. *Plain drawing of sections of model: T.S. in perspective one above the other (image and anatomy).* 1965. King's College, University of Durham. 360 x 510 mm. NAEA.

Figure 48: Anonymous: Student of Richard Hamilton. *Basic Design Exercise (Image and Anatomy).* 1964. King's College, University of Durham. 380 x 510 mm. NAEA.

Figure 49: Dickin, Jenny. Student of Richard Hamilton. *Basic Design Exercise (Image and Anatomy).* 1965. King's College, University of Durham. 380 x 560 mm. NAEA.

Figure 50: Anonymous: Student of Richard Hamilton. *Basic Design (Imagined Anatomy)*
1964. 360 x 510 mm. NAEA.

Figure 51: Anonymous: Student of Richard Hamilton. *Basic Design Exercise (Image and Anatomy).* 1964. King's College, University of Durham 380 x 505 mm NAEA

Figure 52: Anonymous. Exhibition Map (inside cover). *Science Exhibition Catalogue-Guide.* 1951. South Kensington Museum

Figure 53: Anonymous. *The Doomsday clock, ten to midnight.* 1969.

Figure 54: Anonymous. *Time Piece Recovered from Hiroshima.*1945.

Figure 55: Hargreaves Gillian. Student of Richard Hamilton. *Exercise: Random points. Basic Design work.* 1963. 510 x 320 mm. NAEA.

Figure 56: Anonymous: Student of Richard Hamilton. *Drawing: Point- matchsticks aimed at the central line. Basic Design work*. 370 x 560 millimetres. NAEA.

Figure 57: Lore, B.H. Student of Richard Hamilton. *Exercise: Point. Basic design work.* 1963. 560 x 380 millimetres. NAEA.

Figure 58: Richard Hamilton. Cover for *The Developing Process* exhibition booklet. 1959

Figure 59: Hargreaves, Gillian. Student of Richard Hamilton. *Exercise: Point- picking out all "THE´s" on newsprint. Basic design work*. 1963. 510 x 320 millimetres. NAEA.

Figure 60: Anonymous: Student of Richard Hamilton. *Point. Basic Design Work*. 1965 NAEA.

Figure 61: Roy Ascott. *Change Painting.* 1960. Wood, Perspex and Paint.

Figure 62: Roy Ascott. *Change Painting.* 1961. Wood, Perspex and Paint.

Figure 63: Roy Ascott. *Video Roget.* 1962. Analogue Structure, Plexiglas, wood and glass. 50 x 35".

Bibliography

1) Interviews

Hornsey

Sloan, C. L. (2006) *Interview by Email exchange with Tim Jones.*

Sloan, C. L. (2006) *Interview by Email exchange with Dante Leonelli.*

Sloan, C. L. (2006) *Interview by Email exchange with Philip Maltman.*

Sloan, C. L. (2006) *Interview by Email exchange with Tom Nairn.*

Sloan, C. L. (2006) *Interview by Email exchange with David Page.*

Sloan, C. L. (2006) *Interview by Email exchange with John Yeadon.*

King's College/Basic Design

Sloan, C. L. (2011) *Interview by Email exchange with Stephen Buckley.*

Sloan, C. L. (2011) *Interview by Email with Ron Dutton.*

Sloan, C. L. (2011) *Interview by Email exchange with Anne Carrington.*

Cyprus College of Art/Leeds College of Art/Basic Design

Sloan, C. L. (2011) *Interview with Stass Paraskos.*

Groundcourse

Sloan, C. L. (2012) *Interview with Roy Ascott.*

Sloan, C. L. (2012) *Interview by Email exchange with John Bonehill.*

2) UK Art Education Documents, Policies and Enquiries:

The Instrument of Foundation of the Royal Academy of Arts in London
Signed by George III on 10th December 1768

Ball, C. (1982) *The Arts and Higher Education.* Society for Research into Higher Education

Board of Education. *General Reports on Higher Education for 1902 (board of education)* (1902)
Bray, F. (1947) *Committee on Art Examinations (Bray Report)* National Advisory Committee on Art Education.

Coldstream, W. (chair) (1960) *First Report of the National Advisory Council on Art Education* (*The First Coldstream Report)*

Coldstream, W. (chair) (1965) *First Report of the National Advisory Council on Art Education: Addendum.* HMSO.

Coldstream, W. (chair) (1970) *Joint Report of the National Advisory Committee on Art education and the National Council for Diplomas in Art and Design (The Second Coldstream Report)*

Crowther, G. (1959) *The Crowther Report.* Central Advisory Council for Education.

Ewart, W. (MP) (1836) *Report of the Select Committee on Arts and Manufactures.*

Eyre, G. E. (chair) *First Report of the Department of Practical Art* (1853)

Eyre, G. E. (chair) (1854) *First Report of the Department of Science and Art.* HMSO.

Gann, A. S. (1974) *Vocational Courses in Art and Design: Report of the Working Group on Vocational Courses in the Design Technician Area (The Gann report)*

Gibson, T. M. (1849) *Report of the Select Committee on the Government School of Design*. Reprinted in: *British Parliamentary Papers.* (1970) pp. 247-396.

Gorell, R. (1936) *Report of the Committee on the Production and Exhibition of Articles of Good Design and Everyday Use: 'Art and Industry'(The Gorell Report)* Board of Trade.

Hadow, H. (chair) (1931) *The Report of the Consultative Committee: The Primary School.*

Hadow, H. (chair) (1926) *Report of the Consultative Board of Education: The Education of the Adolescent (The Hadow Report)*

Hambleden, W. (1936) *Report of the Committee on Advanced Art Education in London (The Hambleden Report)* HMSO.

Her Majesty's Inspectorate. (1992) *Higher Education in the Polytechnics and Colleges: Art and Design*

Mason, S. C. (1970) *Second Report of the National Council of Diplomas in Art and Design*

Ministry of Education. (1958) *Circular 340* (14th July 1958)

Ministry of Education. (1946) *Pamphlet No. 6: 'Art Education'.* HMSO.

Newson, J. (chair) (1963) *Report of the Central Advisory Council on pupils aged 13 to 16 of average and less than average ability (Half our Future.)* (The Newson Report) Central Advisory Council for Education.

Northcote, S. (chair) (1864) *Report of the Select Committee on the Schools of Art.* HMSO.

Samuelson, B (chair) (1884) *Report of the Royal Commission on Technical Instruction (The Samuelson Report)*

Select Committee on Education and Science. (1969) *Report of the Select Committee on Education and Science (Student Relations)* HMSO.

Spens, W. (1938) *Report of the Consultative Committee on Secondary Education with special reference to Grammar Schools and Technical High Schools. (The Spens Report)* HMSO.

Summerson, J. (chair) (1964) *First Report of the National Council for Diplomas in Art and Design (Summerson Report)* HMSO.

3) Other Primary Sources

Albers, J. (1939) "Concerning Fundamental Design". In Bayer, H., Gropius, W. & Gropius L. (eds.), (1939) *Bauhaus, 1919-1928.* George Allen & Unwin Ltd. London. pp. 16-120

Alloway, L. (1959) *Letter from Lawrence Alloway to William Johnstone*, 03/04/1959, William Johnstone archive, National Library of Scotland Inv. Ref: ACC 8183/2

AMHCA. (1968) *Document One*, 28th May 1968. Hornsey College of Art Archive, the University of Middlesex.

AMHCA. (1968) *Document Three.* June 1968. Hornsey College of Art Archive, the University of Middlesex.

AMHCA. (1968) *Document 10: Suggestions for the Adaptation of Secondary Education to fit in with a New Concept of Art Education*. The Hornsey College of Art Archive, the University of Middlesex. 2 June 1968

AMHCA. (1968) *Letter from Beaux Arts.* June 1968. Hornsey College of Art Archive, the University of Middlesex.

AMHCA. (1968) *Proposal for an Alternative System of Education.* Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 19:* Programme for Tuesday 4 June. Hornsey College of Art Archive, Middlesex University.
AMHCA. (1968) *Document21: Interim report of educational seminar in Room B*. 4 June, 1968. Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document22: The Constitution (Proposed)* 4 June 1968. Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 30: Report from Seminar in Room H*. 4 June 1968. Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 31: RE The ICA Proposition*. 6 June 1968. Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 50: To Lawrence A Baines, Chairman of the Governors of Hornsey College of Art.* 12 June 1968. Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 51: Points for Discussion in Fine Art Seminar.* 14 June 1968. Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 52: Important of Work Projects.* Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 52 c: "Hornsey Strikes Again".* Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 55: Study paper: Quick Thoughts on the Network. D.J. Warren Piper* Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 58: Report on Seminar held at 10pm on Friday 14th June in Rooms A&B.* Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 59: (event structure research group) NOTICE TO PRESS*. Saturday 15th June. Hornsey College of Art Archive, Middlesex University.

AMHCA. (1968) *Document 71: Agenda for General Meeting to be Held on July 6th at 12am in rooms A & B.* Hornsey College of Art Archive, Middlesex University.

AMHCA. (1969) "On the Reasons for a Revolution". *Leonardo*. vol. 2. p. 193-198

Ascott, R. (1963) *Diagram Boxes and Analogue Structures.* Molton Gallery. London.

Ascott, R. (1965) "Statement". *Control Magazine.* Issue One. 1965

Ascott, R. (2003) Telematic Embrace: Visionary Theories of Art Technology and Consciousness. Edited with an Essay by Edward A. Shanken, E. Berkeley: University of California Press.

Ascott, R. (1964) "The Construction of Change". *Cambridge Opinion 41 (Modern Art in Britain)* pp. 37-42. 1964.
Ashby, W. R. (1960) *Design for a Brain.* Chapman and Hall. London.
Ashwin, C. (1975) *Art Education: Documents and Policies 1768-1975.* SRHE. London.

Ashwin, C. (ed) (1982) *A Century of Art Education 1882-1982.* Middlesex Polytechnic. Middlesex.

ASSHCA, Document 52, June 1968. Hornsey College of Art Archive, the University of Middlesex.

ASSHCA. (1969) *The Hornsey Affair*. Penguin Educational Specials. London
Barthes, R. (1977) "The Death of the Author". *Image, Music, Text.* Fontana. London. pp. 142-148

Bronowski, Jacob. 1951. "Exhibition of Science, South Kensington," guide-catalogue. Cited in: Moffat, I. "A Horror of Abstract Thought". Postwar Britain and Hamilton's 1951 "Growth and Form" Exhibition." *October.* Vol. 94. The Independent Group. (Autumn, 2000.) pp. 89-112.

Burnham, J. (1968) *Beyond Modern Sculpture: the Effects of Science and Technology on the Sculpture of this Century.* G. Braziller. New York.

Burnham, J. (1970) "The Aesthetics of Intelligent Systems" in: *On the Future of Art* (New York: Viking Press), pp. 95-122.

Burnham, J. (1968) "Systems Esthetics". *Artforum.* September, 1968. Viewed online 11/02/2013 at: http://www.arts.ucsb.edu/faculty/jevbratt/readings/burnham_se.html

De Sausmarez, Maurice, *et al.*, "A Visual Grammar of Form". *Motif.* Winter 1961, pp.3-29.

De Sausmarez, Maurice *et al.* (1962), "A Visual Grammar of Form (2)". *Motif.* Summer 1962, pp.47-67.

De Sausmarez, M. [1964] (2006) 2nd Ed. *Basic Design: the Dynamics of Basic Form.* A. C. & Black. London.

Ehrenzweig, A. *Psychological Factors in Teaching Basic Design.* Unpublished draft typescript. William Johnstone Archive, National Library of Scotland Dep. 332/6.

Ehrenzweig, A. (1967) *The Hidden Order of Art: A Study in the Psychology of Artistic Imagination.* Weidenfeld and Nicolson. London.

George, F. H. (1962) *The Brain as Computer.* Pergamon Press. Oxford.

George, F. H. (1959) *Automation, Cybernetics and Society.* Pergamon Press. Oxford.

Gibson, T. M. (chair) (1849) *Report of the Select Committee on the Government School of Design.*

Giedion, S. (1975) [1948] *Mechanization takes Command: A Contribution to Anonymous History.* Oxford University Press. Oxford.
Hall, E.M. & Dennis, L.A. (1968) *Living and Learning*: *The Report of the Provincial Committee on Aims and Objectives of Education in the Schools of Ontario (The Hall-Dennis Report)* Ontario Department of Education. Toronto.

Hamilton, R. (1982) *Collected Words 1953-1982.* Thames and Hudson. London.

Hamilton, R. (1949) *On Growth and Form* Proposal for Herbert Read. Tate Gallery ICA archive. TGA 955. 1. 12. 26.

Hamilton, R. *Growth and Form Exhibition, First Draft Schedule*, ICA Papers, Tate Gallery Archive 955.1.12.26, also reprinted in Jacob. J (*ibid.)* He dates this to 1949, slip page at Tate marked Dec 1950

Hamilton, R. (1949) *Draft Proposal for On Growth and Form.* ICA Archives. p. 1.

Hamilton, R, (1951) *Transcript of Public View of On Growth and Form.* No. 1. 9 January 1951. ICA Archives. pp. 10-11

Johnstone, W. (1981) *Letter to Art News and Review*. William Johnstone Archive, National Libraries of Scotland. Ref ACC. 8183/2

Johnstone, W. (1981) *Letter to William Johnstone, signed 'Jack'*. 13/04/81. William Johnstone archive, National Library of Scotland. Acc. 8183

Johnstone, W. (1980) *Points in Time.* Barrie and Jenkins. London.

Johnstone, W. (1969) *Unsent letter.* Johnstone archive, National Library of Scotland. Dep. 322

Johnstone, W. *Typescript about the Central School*, William Johnstone archive, National Libraries of Scotland Dep. 322

Johnstone, W. (1959) *Central School of Arts and Crafts*. Central St. Martins. London.

Pasmore, V. et al. (1959) *The Developing Process: Work in progress Towards a New Foundation in Art Teaching as Developed at the Department of Fine Art, Kings College Durham University, Newcastle upon Tyne, and at Leeds College of Art.* Published on the occasion of an exhibition at the ICA London. King's College: Durham.

Pasmore, V. (1981) *Letter to Art News and Review.* May 1981. NLS Johnstone Archive Dep. 322

Pasmore, V. (1981) "The Artist Speaks". *Art News and Review.* Vol.III, 2. 24th February 1951. p.3.

Reichardt, J. (1968) "Cybernetic Serendipity: The Computer and the Arts". *Studio International* (special issue) July, 1968. Studio International. London.
Reichardt, J. (1968) *Press Release for Cybernetic Serendipity.* Viewed online 01/04/2013 at: http://cyberneticserendipity.net/

Read, H. (1931) *The Meaning of Art*. Faber & Faber. London.

Read, H. (1931) "Paid Klee". In *The Listener,* Vol. V, No. 115. 25 March 1931. p. 509

Read, H. "From the First Stroke". In *The Listener.* Vol. VI, No. 145. 21 October 1931.
pp. 693-694

Read, H. "The Golden Section". In *The Listener,* Vol. V, No-107. 28 January 1931. pp. 142-143

Read, H. (1934) *Art and Industry.* Faber & Faber Ltd. London.

Read, H. "Our Terminology". In *Axis,* No. 1. January 1935. pp. 6-8

Read, H. (1936) "Abstract Art: A Note for the Uninitiated". In *Axis* No. 5. Spring 1936. p. 3

Read, H. (1936) *Art and Society.* Faber & Faber. London.

Read, H. (1937) "The Faculty of Abstraction". In: Martin, J.L ., Nicholson, B. & Gabo, N. (eds.) *Circle: International Survey of Constructive Art.* Faber & Faber. London. pp. 6l -66

Read, H. (1947) “The Fate of Modern Painting”. In *Horizon.* Vol. XV1, No. 95. November 1947. pp. 242-254

Read, H. (1964) *A Concise History of Modern Sculpture.* Thames and Hudson, London.

Read, H. (1967) *Education Through Art.* Faber and Faber. London.

Read, H. (1930) “The Meaning of Art”. *The Listener.* 29 January 1930.

Skinner, B. F. (1953) *Science and Human Behaviour.* Pearson Education Inc.

Thompson, D. W. (1917) *On Growth and Form.* Cambridge University Press. Cambridge.

The Times Newspaper “Takeover by College Students” *The Times Newspaper.* 29 May 1968. p. 1

The Times Newspaper. (1967) “Advertisement for teaching Staff”. *Times Educational Supplement*. 1967

The Times Newspaper. (1960) “New Diploma in Art and Design: Minister Approves Big Changes in Advanced Courses”. Wed Nov 23rd, 1960.

The Times Newspaper. (1968) “Takeover At College By Students”. p. 1. 29th May, 1968

The Times Newspaper. (1968) “Art Courses Are ‘In a Mess’”. June 7th, 1968.
The Times Newspaper. (1968) “The Hornsey College of Art: Letter from Sir Robin Darwin, rector and vice-provost, RCA”. Fri 30th Aug, 1968

The Times Newspaper. (1968) “The Hornsey College of Art: Letter from From John Summerson”. Sat Aug 31st, 1968.

The Times Newspaper. (1968) **“**Support for Students**”.** Mon Sept 2nd, 1968.

The Times Newspaper. (1968) “Power Plan for Art Students”. Wed 4th Sept, 1968

The Times Newspaper. (1968) “The Reopening of Hornsey College: Letter to the Editor from Professor Lord Queensberry of RCA”. Thurs Sept 26th, 1968

The Times Newspaper. (1968) “Art College Fortified Students Say”. Fri Nov 1st, 1968.

The Times Newspaper. (1968) “School Authorities Accused of Policy of Attrition”. Thurs May 29th, 1969

The Times Newspaper. (1969) “No Entry for Former Students” Thurs Sept 4th, 1969

The Times Newspaper. (1969) “Expelled Student Reinstated”. Sat 4th Oct, 1969

Whyte, L. L. (1951) *Aspects of Form: A Symposium on Form in Nature and Art.* Lund Humphries. London.

Willats, S. (1979) *Concerning Our Present Way of Living*. Whitechapel Art Gallery & Stedelijk Van Abbemuseum, Eindhoven.

Wiener, N. (1988) [1950]. *The Human Use of Human Beings.* Da Capo Press. Boston

Willats, S. (1965) “Editorial”. *Control Magazine.* Issue One, 1965.

4) Secondary Sources

Adorno, T. W. & Jones, M. T. (1982) “Trying to Understand Endgame”. *New German Critique.* No. 26: Critical Theory and Modernity. Spring-Summer 1982. pp. 119-150

Alloway, L. (1966) “Art and the Communications Network”. *Canadian Art.* Issue 100. January 1966.

Anonymous. (Editorial) (1962) “Art History in the Art Schools”. *Burlington Magazine*. no. 716, vol. CIV, November 1962. p. 452

Arnheim, R. (1954) *Art and visual perception: A Psychology of the Creative Eye.* University of California Press. California.

Arnheim, R. (1943) “Gestalt and Art”. In: *Journal of Aesthetics and Art Criticism, 2,* pp. 71-5.

Arnheim, R. (1966) *Towards a Psychology of Art.* University of California Press. California.

Arnheim, R. (1969) *Visual Thinking*. University of California Press. Berkeley.

Barron, F. (1963) *Creativity and Psychological Health: Origins of Personal Vitality and Creative Freedom.* Nostra Comp. Princeton.

Baudelaire, C. (1964) [1863]. *The Painter of Modern Life and other Essays.* Phaidon. London.

Baudrillard, J. (1994) [1981] *Simulacra and Simulations - III. Holocaust.* Transl. Sheila Faria Glaser. University of Michigan Press. Michigan.

Baudrillard, J. (trans. Glaser, S. F.) (1978) “Holocaust”. In Levi, N. & Rothberg, M. (eds) (2003) *The Holocaust: Theoretical Readings.* Edinburgh University Press. Edinburgh. pp. 380-382.

Becker. H. S. (1982) *Art Worlds.* University of California Press. London

Benjamin, W. (1979) “One Way Street” (1925-26) *One Way Street and Other Writings.* Trans. by Jephcott, E. and Shorter, K. New Left Books. London. pp. 103-104.

Benjamin, W. (1996) *Walter Benjamin: Selected Writings.* Harvard University Press. Harvard.

Blanchot, M. (1980) *The Writing of the Disaster.* Transl: Smock, A. University of Nebraska Press. Nebraska.

Botar, O. A. L. & Wünsche, I. (2011) *Biocentrism and Modernism.* Ashgate. Aldershot.

Bourdieu, P. (1990) *The Logic of Practice*. Polity Press.

Bracewell, M. (2007) *Re-Make/Re-Model: Becoming Roxy Music.* De Capo Press. Cambridge. pp. 195-208

Broderick, M. & Traverso, A. (2010) “Interrogating Trauma: Towards a Critical Trauma Studies”. *Continuum: Journal of Media & Cultural Studies.* 24:1. pp. 3-15.

Camus, A. (1945) "Editorial". *Combat Magazine.* 8 August 1945.

Castells, M. (1996) *The Rise of the Network Society.* Blackwell. Oxford.

Causey, A. “Herbert Read and Contemporary Art”. In Goodway, D. (ed.), (1998) *Herbert Read Reassessed.* Liverpool University Press. Liverpool. pp. l23-144

Caute, D. (1988) *The Year of the Barricades*. Harper Collins. London.

Churchill, W. (1949) “The Wizard War”. *The Second World War Volume II.* Haughton Mifflin Company. New York.
Corris, M. (2004) “Recoding information, Knowledge, and Technology”. In *Conceptual Art: Theory, Myth, and Practice.* Cambridge University Press. Cambridge. pp. 187-199.

Cowan, D. “Containing Insecurity”, in Graham, S. (ed) (2010) *Disrupted Cities: When Infrastructure Fails.* Routledge. Oxford.

Crosthwaite, P. (2009) *Trauma, Postmodernism and the Aftermath of World War II.* Palgrave Macmillan. Basingstoke.

Darts, D. (2004) “Visual Culture Jam: Art, Pedagogy, and Creative Resistance” *Studies in Art Education: A journal of Issues and Research.* 2004. 45 (4) pp. 313-327.

Derrida, J. (1991) *Cinders.* Transl. by Ned Lukacher, quoted in Eaglestone. *Holocaust.* p. 289.

Derrida, J. (1989) *Memoires for Paul de Man.* Revised edn. Transl, by Cecile Lindsay et al. Columbia University Press. New York.

Derrida, J. (2005) *Rogues: Two Essays on Reason.* Stanford University Press. Stanford.

Descartes, R. (1971) *Treatise of Man.* Trans. Thomas Steele Hall. Ed. Bernard I. Cohen et al, Harvard University Press. Cambridge.

Dickson, T. E. (1971) “Art Colleges and the Cultural Revolution”. In *British Journal of Educational Studies.* Vol. 19, No. 3. Oct 1971. pp. 250-262

Dyson, A. (ed) (1983) *Art and Design Education: Heritage and Prospect.* Institute of Education, University of London. London.

Eaglestone, R. (2004) “Cinders of Philosophy, Philosophy of Cinders: Derrida and the Trace of the Holocaust”. In *The Holocaust and the Postmodern.* Oxford University Press. Oxford. pp. 279-299.

Edwards, P. N. (1996) *The Closed World: Computers and the Politics of Discourse in Cold War America.* MIT Press. Massachusetts.

Eisner, E. W. (1972) *Educating Artistic Vision.* Macmillan Publishing Co. New York.

Forrest, E. (1983) *Harry Thubron: His Contribution to Foundation Studies in Art Education.* Doctoral thesis. Ohio State University. Ohio.

Forrest, E. (1985) “Harry Thubron at Leeds and Views on the Values of his Ideas on Art Education for Today”. *International Journal of Art and Design Education.* Vol. 4.2. pp. 147-167

Field, D. (1977) “Recent Developments and Emerging Problems in English Art Education”. In *Art Education*. Vol. 30, No. 8. Dec 1977. pp. 5-8

Freire, P. (2000) [1970] *Cultural Action for Freedom.* Harvard Education Review. p. 40

Freud, S. (2004) *Studies in Hysteria.* Transl. Nicola Luckhurst. Penguin Books. London.

Freundlich, A. L. (1975) "On the University as the Best Environment for Training Artists". In *Leonardo.* vol. 8. pp. 121-124

Fuller, B. (1969) [1965] *Utopia or Vision: The Prospects of Humanity*. Bantam Books. New York.

Gasquet, J. (1991) *Cézanne, - a Memoir with Conversations.* Thames and Hudson, London.

Gibson, J.J. & Gibson, E. (1955) "Perceptual learning: Differentiation or Enrichment?" In: *Psychology Review*. 62. pp. 32-41.

Gibson, J.J. (1950) *The Perception of the Visual World*. Houghton Mifflin. Boston.

Gibson, J.J. (1960) "The Concept of the Stimulus in Psychology". In: *The American Psychologist* 15/1960, pp. 694-703.

Gibson, J.J. (1966) *The Senses Considered as Perceptual Systems.* Houghton Mifflin. Boston.

Gibson, J.J. (1972) "A Theory of Direct Visual Perception". In J. Royce, W. Rozenboom (Eds.) *The Psychology of Knowing*. Gordon & Breach: New York.

Giedion, S. (1941) *Space, Time and Architecture: The Growth of a New Tradition.* University of Harvard. Harvard.

Gillespie, R. (1991) *Manufacturing Knowledge: A History of the Hawthorne Experiments.* Cambridge University Press. Cambridge.

Giroux, H. A. (1991) "Border Pedagogy and the Politics of Modernism/Postmodernism*". Journal of Architectural Education.* Vol. 44, No. 2. (Feb., 1991) pp. 69-79

Giroux, H. A. (2001) [1983] *Theory and Resistance in Education: Towards a Pedagogy for the Opposition.* Bergin and Harvey. London.

Gombrich, E. H. (1989) "Review of James J. Gibson and the Psychology of Perception by Edward S. Reed". *New York Review of Books.* January 19th, 1989. pp.13-15

Garlake, M. (1998) *New Art, New World- British Art in Postwar Society.* Yale University Press New Haven & London.

Goodway, D. (1998) *Herbert Read Reassessed.* Liverpool University Press. Liverpool.

Gould, S. J. (1971) "D'Arcy Thompson and the Science of Form". *New Literary History.* Vol. 2. No. 2. Form and its Alternatives. Winter, 1971. pp. 229-258.

Grieve, A. (1982) “Charles Biederman and the English Constructionists I: Biederman and Victor Pasmore”. *The Burlington Magazine*, Vol. 124, No. 954, (Sep., 1982), pp. 540-551.

Groys, B. (2009) “Education by Infection”. *Art School: Propositions for the Twenty-First Century*. MIT Press. MA. p. 27

Groys, B. (1992) *The Total Art of Stalinism: Avant-garde, Aesthetic Dictatorship, and Beyond*. Princeton University Press. Oxford.

Harding H.F & Parnes S. J (Eds) (1962) *A Source Book for Creative Thinking*. Charles Scribners & Sons. New York.

Hausman, C. R. (1975) *A Discourse on Novelty and Creation.* Martinus Nijhoff. The Hague.

Hausmann, C. R. & Rothenburg, A. (eds) (1976) *The Creativity Question.* Duke University Press. Durham.

Heidegger, M. (1964) "The Question Concerning Technology", from Martin Heidegger: *Basic Writings from "Being and Time" (1927) to "The Task of Thinking" (1964*), rev. ed., edited by David Farrell Krell. Harper: San Francisco.

Heisenberg, W. (1962) *Physics and Philosophy: The Revolution in Modern Science.* Harper. New York.

Hess, T. (1970) "Gerbils ex Machina". *Art News.* (December, 1970) p. 23.

Hodgkin, R. A. (1976) *Born Curious.* John Wiley and Sons. Oxford.

Hirsch, B. M. (1970) “For a Change in the Education of Artists”. In *Leonardo*. Vol. 3. pp. 173-176

Jameson, F. (1991) *Postmodernism, Or the Cultural Logic of Late Capitalism.* Duke University Press. Durham, NC. p. 35

Jacob, J. (1986) *Die Entwicklung der Pop Art in England ... von ihren Anfdngen bis 1957-Das Fine-Popular Art Continuum.* Peter Lang, Frankfurt.

Jenkins, H. (1979) *The Culture Gap: An experience of Government and the Arts.* Marion Boyers. London.

Jones, P. L. (1975) “Art Students and Their Troubles”. In *Leonardo.* Vol. 8. pp. 61-65

Jordanova, L. (ed) 'Introduction'. In: *Languages of Nature: Critical Essays on Science and Literature.* London. Free Association Books.

Joyce, M. (2000) *Othermindedness: The Emergence of Network Culture.* The University of Michigan Press. MI.

Kandinsky, W. (1975) [1926]. *Point to Line to Plane.* Dover. Mineola.

Kauffman, S. (1995) *At Home in the Universe: The Search for laws of Complexity.* Penguin. London.

Knight, C. (1990) *The Making of Tory education Policy in Post-War Britain 1950-1986.* The Falmer Press. London.

Koffka, K. (1999) [1935]. *Principles of Gestalt Psychology*. Routledge. New York.

Krausse, J. et al. (2009) *New Views on R. Buckminster Fuller.* Stanford University Press. California. pp. 72-73

Kuhn, T. S. (1996, 3rd Edition) *The Structure of Scientific Revolutions.* University of Chicago Press. Chicago & London.

Leach, D. (1993) *Richard Hamilton: The Beginnings of His Art.* Peter Lang, Frankfurt.

Le Grice, M. "History Lessons". *Frieze Magazine.* October 2011. Issue 142.

Le Grice, M. (ed) (2009) *From Floor to Sky: The Experience of the Art School Studio.* A & C Black Ltd. London.

Lerner, F. (2005) "Foundations for Design Education: Continuing the Bauhaus Vorkurs Vision". *Studies in Art Education.* Vol. 46, No. 3 (Spring, 2005) pp. 211-226

Lonsdale, K. (1953) "Aspects of Form" (book review) *Acto Crystallographica*. P. 224

Lyotard, J. F. (1984) [1979] *The Postmodern Condition.* Manchester University Press. Manchester

Lyotard, J. F. (1985) "Retour au postmoderne". *Magazine Littéraire.* 225. December 1985.

MacDonald, S. (1970) *The History and Philosophy of Art Education*. University of London. London.

Madge, C. & Weinberger, B. (eds) (1973) *Art Students Observed.* Faber & Faber. London.

Madoff, S. H. (2009) *Art School (Propositions for the 21st Century)* MIT Press. MA.

Manson, D. (2010) *Willy Tirr (1915-1991) Figures in a Landscape.* Authorhouse. Milton Keynes.

Martin, C. J. (2011) "Artworld, Network and other Alloway Keywords". *Tate Papers.* Issue 16. 1 October 2011.

Massey, A. (1995) *The Independent Group: Modernism and Mass Culture in Britain, 1945-1959.* Manchester University Press, Manchester.

McCumber, J. (1991) "The Holocaust as Master-Rupture: Foucault, Fackenheim, and "Postmodernity" " In: *Postmodernism and the Holocaust.* Ed. Milchman and Rosenberg. pp. 239-264.

Mellor, D. (1993) 'Existentialism and Postwar British Art', in, Mortis, F. (ed.) (1993) *Paris Postwar: Art and Existentialism 1945-55*, Tate. London. pp. 53-62.

Mellor, D. (1992) "The Pleasures and Sorrows of Modernity: Vision, Space and the Social Body" in Hamilton, R. (1992) *Richard Hamilton.* Tate. London. pp. 27-39

Mingers, J. (1995) *Self-Producing Systems.* Plenum Press. New York.

Moffat, I. (2000) "A Horror of Abstract Thought': Postwar Britain and Hamilton's 1951 'Growth and Form' Exhibition". In: *October* Vol. 94, The Independent Group, (Autumn, 2000), pp. 89-112

Moffatt, I. (2002) *The Independent Group's Encounters with Logical Positivism and Searches for Unity in the 1951 Growth and Form Exhibition.* PhD Diss. MIT.

Molella, A. P. (2002) "Science Moderne: Sigfried Giedion's Space, Time and Architecture and Mechanization Takes Command". *Technology and Culture.* Vol. 43, No. 2 (April 2002) pp. 374-389.

Morris L. *The Impersonal Eye of the Camera*, accessed July 2007 at: http://thehornseyproject.omweb.org/modules/wakka/LindaMorrisPaper

Morrish, I. (1972) *The Sociology of Education.* George Allen & Unwin Ltd. London.

Nairn, T. (1965) "Labour Imperialism". *New Left Review.* I/32. July-Aug 1965

Nairn, T. (1963) "Landed England". *New Left Review.* NLR I/20. Summer 1963. pp. 116-119

Nairn, T. (1964) "The British Political Elite". *New Left Review.* NLR I/23. Jan-Feb 1964. pp. 16-25

Naylor, G. (1985) *The Bauhaus Reassessed.* Herbert Press. London.

Odling-Smee, A. (2001) "Interview with Ken Garland". *Eye Magazine.* Issue 66.

Paraskos, M. (ed) (2010) *Stass Paraskos.* Orage Press. London.

Pethick, E. (2006) “Degree Zero”. *Frieze Magazine, issue 101.*

Peters, M.A. (2006) “Lyotard, Nihilism and Education”. *Studies in Philosophy and Education.* pp. 303-314. p. 309

Piper, D. W. (1973) *Readings in Art and Design Education: 1 After Hornsey.* Davis-Poynter. London.

Piper, D. W. (1973) *Readings in Art and Design Education 2: After Coldstream.* Davis-Poynter. London.

Poling, C V. (1987) *Kandinsky’s Teaching at the Bauhaus.* Rizzoli. New York. pp. 106-113

Pollock, G. (1992) *Avant-garde Gambits,1888-93.* Thames and Hudson. London

Pullman, B. (1998) *The Atom in the History of Human Thought.* Oxford University Press. Oxford. pp. 258-262

Radstone, S. (2005) “Reconceiving Binaries: the Limits of Memory”, in *History Workshop Journal,* 59:1: pp. 134-150.

Riskin, J. (2003) “The Defecating Duck, or the Ambitious Origins of Artificial Life”. *Critical Inquiry*. Vol. 29, No. 4, Summer 2003. pp. 599-633

Robbins, D. (ed) (1990) *The Independent Group: Postwar Britain and the Aesthetics of Plenty.* MIT Press. Cambridge.

Robinson, K. (1982) *The Arts and Higher Education.* Society for Research into Higher Education. London.

Roslansky, J. D. (1970) *Creativity: A discussion at the Nobel conference.* North Holland Publication Co. Amsterdam.

Rushton, D & Wood, P. (1979) *The Politics of Art Education.* Studio Trust. London.

Russell, B. (1945) "The Bomb and Civilization". *Glasgow Forward*, August 18 1945

Sandlin, J.A. & Milam, J. L. (2008) "“Mixing Pop (Culture) and Politics”: Cultural Resistance, Culture Jamming, and Anti-Consumption Activism as Critical Public Pedagogy”. *Curriculum Inquiry.* Vol. 28. Issue 3. pp. 323-350. June 2008.

Seago, A. (1995) “Seize the Sans Serif”. *Eye Magazine.* Vol. 16. No. 4.

Seago, A. (1995) *Burning the Box of Beautiful Things: The Development of a Postmodern Sensibility.* Oxford University Press. Oxford.

Shanken, E. A. (1998) *The House that Jack Built: Jack Burnham's Concept of "Software" as a Metaphor for Art.* Leonardo Electronic Almanac 6:10 (November, 1998) viewed 01/03/2013 at: http://mitpress.mit.edu/e-journals/LEA/ARTICLES/jack.html

Shanken, E. A. "From Cybernetics to Telematics: The Art, Pedagogy and Theory of Roy Ascott". In: Ascott, A. (2003) *Telematic Embrace: Visionary Theories of Art, Technology and Consciousness.* University of California Press. pp. 34- 39

Simpson, J. Y. (1933) "Science and the Idea of God". In *The Listener.* Vol. IX, No. 217. 8 March 1933. pp. 377-378

Skrebowski, L. (2006) "All Systems Go: Recovering Jack Burnham's Systems Aesthetics". *Tate Papers.* Spring, 2006. Viewed online 03/03/2013 at: http://www.tate.org.uk/download/file/fid/7301

Sonntag, E. (1969) "Foundation Studies in Art Today". In *Leonardo.* Vol. 2. pp. 387-397

Spiller, J (ed) Klee, Paul. (1961) *The Thinking Eye.* Percy Lund (London) p. 151

Stallabrass, J. (1999) *High Art Lite: The Rise and Fall of Young British Art.* Verso. London

Steers, J. et al. (2002) "David Thistlewood Obituary. *Journal of Art and Design Education.* Vol. 18. Issue 3. Dec. 2002. pp. 261-269. p. 267

Steward, J. H. (1955) *Theory of Cultural Change: The Methodology of Multilinear Cultural Evolution.* University of Illinois Press. Illinois.

Stryker, E. M., (2011) "Parallel Systems: Lawrence Alloway and Eduardo Paolozzi". *Tate Papers.* Issue 16. 1 October 2011

Summerson, J. (chair) 1964) First Report of the National Council for Diplomas in Art and Design *(The Summerson Report),* NCDAD

Swenarton, M. (1987) "The Role of History in Architectural Education". *Architectural History.* Vol 30. 1987. pp. 201-215. p. 202

Taylor C. W. (ed) (1964) *Creativity: Progress and Potential.* McGraw-Hill Book Co. New York.

Thistlewood, D. (1981) *A Continuing Process.* Institute of Contemporary Arts (London)

Thistlewood, D. (1984) *Herbert Read: Formlessness and Form: An Introduction to his Aesthetics.* Routledge. London.

Thistlewood, D. (1998) “Obituary. Tom Hudson”. *Journal of Art and Design Education.* Vol. 7. Issue 2.

Tickner, L. (2008) *Hornsey 1968: The Art School Revolution.* Frances Lincoln. London

Van Dijk, P. (2000) *Anthropology in the Age of Technology: The Philosophical Contributions of Gunther Anders.* Rodopi. Amsterdam.von Bertalanffy, L. (1969) *General System Theory: Foundation, Development, Applications.* George Braziller. New York.

Walker, J. A. (2003) *Learning to Paint: A British Art Student and Art School 1956-61,* Institute of Artology.

Wedderburn, A. (2010) *The Works of John Ruskin, volume 16.* Cambridge University Press. Cambridge.

Wertheimer, M. (1935*) Gestalt Theory: A Source Book of Gestalt Psychology*. Trubner & Co., Ltd. London.

Westley, H. (2007) “The Year of the Locked Room”. *Tate Papers.* Issue 9. Spring 2007.

Whitford, Frank. (1994) *Interview with Eduardo Paolozzi.* Artists’ Lives Project. The British Library.

Whitham, G. (1986) *The Independent Group at the Institute of Contemporary Arts: Its Origins, Development, and Influences 1951-1961.* Ph.D. diss., University of Kent at Canterbury.

Wright, N. (1988) “What Happened At Hornsey”. *AND Journal of Art.* No. 17, 1988.

Williamson, Beth. (2008) *Anton Ehrenzweig: Between Psychoanalysis and Art Practice*. PhD Thesis, University of Essex.

Williamson, B. (2008) “Paint and Pedagogy: Anton Ehrenzweig and the Aesthetics of Art Education”. *Rebus.* Issue 2. Autumn 2008.

Wittgenstein, L. (trans. Peter Winch) (1946) *Culture and Value.* University of Chicago Press. Chicago. pp. 48-49

Woods, A. & Grant, T. (2002) *Reason in Revolt: Dialectical Philosophy and Modern Science.* Algra Publishing.

Wundt, W. (1874) *Principals of Physiological Psychology.* Engelmann. Leipzig.

Yeomans, R. (1987) *The Foundation Course of Victor Pasmore and Richard Hamilton 1954-1966.* Doctoral thesis. Institute of Education, University of London.

Yeomans, R. "Basic Design and the Pedagogy of Victor Pasmore and Richard Hamilton". In Romans, M. (ed) (2005) *Histories of Art and Design Education.* Intellect Books. Bristol.

Yeomans, R. (1988) “Basic Design and Richard Hamilton’s Teaching”. *The Journal of Art and Design Education.* Vol. 7. No. 2. 1988. pp. 155-156

Yeomans, R. *The Pedagogy of Victor Pasmore and Richard Hamilton.* Typescript of paper delivered at the Henry Moore Foundation on Nov 4 2009.

Yeomans, R. (2005) "Basic Design and the Pedagogy of Richard Hamilton". In Romans, R. (ed) *Histories of Art and Design Education.* (2005) Intellect Books. London.